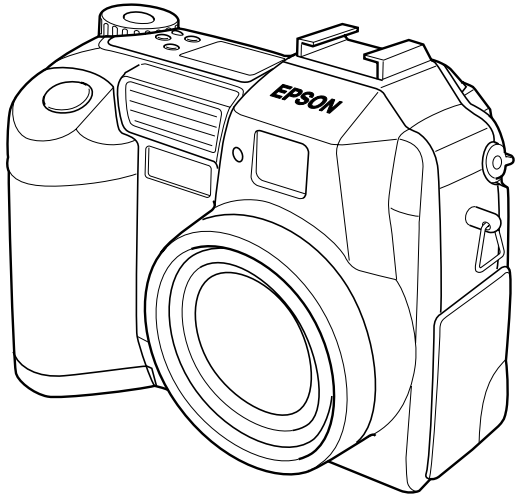
SERVICE MANUAL



Digital Still Camera

EPSON PhotoPC 3000Z

COLOR IMAGING EPSON

EPSON®

SEDC00001

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) Personal injury and 2) damage to equipment.

Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by a WARNING heading.

Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NOWORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of PhotoPC 3000Z. The instructions and procedures included herein are intended for the experienced repair technicians, and close attention should be given to the precautions on the preceding page. Chapters are organized as follows:

CHAPTER 1. PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING

Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENT

Provides adjusting procedures.

CHAPTER 6. MAINTENANCE

Provides check items for maintenance.

CHAPTER 7. APPENDIX

The appendix includes the followings;
-Circuit Board Connection Diagram
-Circuit Board Component Layout
-Circuit Diagram
-Exploded Diagram
-Siemens Star Chart

Revision Status

Revision	Date of Issue	Description
A	April 20, 2000	First Release

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CHAPTER

1

PRODUCT DESCRIPTIONS

1.1 Features

Major features of EPSON PhotoPC 3000Z are as follows.

- ☐ High Picture Quality
  - ■ 3.34 Mega pixel color CCD
  - ■ Hypict output equivalent to 5 Mega pixels
  - ■ Sophisticated image processing technology
  - ■ Variety of Manual / Program shooting function will satisfy the intention of photographers.
- ☐ Full equipment
  - ■ Collapsible optical 3 times zoom lens and optical view finder
  - ■ Hot shoe and built-in flash (Auto, Red eye reduction, Flash compulsion, Flash prohibition, Flash slow synchro)
  - ■ 1.8-inch wide view LCD
  - ■ 16MB Compact Flash card (Standard attachment)
  - ■ Microphone and speaker
  - ■ USB, Serial I/F and AV output terminal
- ☐ High-speed performance
  - ■ Starting time = less than 1 second. (TBD)
  - ■ Simple playback mode reduces customers' stress of confirming the image after taking a picture.
- ☐ Abundant shooting modes
  - ■ Full Auto shooting.
  - ■ Program shooting. (Normal, Landscape, Portrait, Sports)
  - ■ Manual shooting (Full Auto, Aperture priority auto, Full Manual, Fixed settings (TBD)).
  - ■ Exposure adjustment, switching of ISO sensitivity and switching of White Balance (Auto, Fix, Custom) are available.
  - ■ Continuous shooting mode, Interval shooting mode, Digital zoom, Panorama, Macro, Monochrome mode.
- ☐ Video recording supported
  - ■ Using Quick Time format 3.0 or later (Motion JPEG), you can take and play moving films.
  - ■ It is possible to Video Clip shooting and Playback.
  - ■ Max. 25 seconds continuous shooting when taking 15 frame /sec. (Suppose 1 frame is taken by 320 x 240 pixels)
  - ■ Synchronous sound recording and playback are available.
- ☐ Appearance
  - ■ Metal body gives a high-class impression.
  - ■ High performance and compact size.
- ☐ Compliant to the industry standard
  - ■ DCF format
  - ■ DPOF file creation function.
- ☐ Exclusive software
  - ■ EPSON Photo!3
    TWAIN driver, Stand alone utility, OLE server
    High performance software that supports Push Function.
  - ■ EPSON File Converter
    Covers the image on PC to EPSON DCF file.
  - ■ EPSON Photo! Print2
    Easy print is available using Push Function. (only when USB is used.)
- ☐ User I/F
  - ■ GUI is further improved from PhotoPC 800 and PhotoPC 850Z.
  - ■ Easy to understand and easy to use.
  - ■ Supports smooth scrolling under zoom mode.
- ☐ External I/F
  - ■ USB

- Serial
- Video output (NTSC/PAL can be switched by menu.)

☐ Print mark function

- Printon and FDI service supported
- Creates DPOF file.
- Image selection, printing number and index print are selectable.
- Can be used as easy print function.

1.1.1 Exterior View

WEIGHT AND DIMENSION

☐ Dimension: 108mm x 89 x 65mm
(without some parts of protrusions.) (TBD)

☐ Weight: 368g (TBD) (without batteries and strap.)

☐ Tripod mounting holes: JIS B7103 1/4 compliant

APPEARANCE

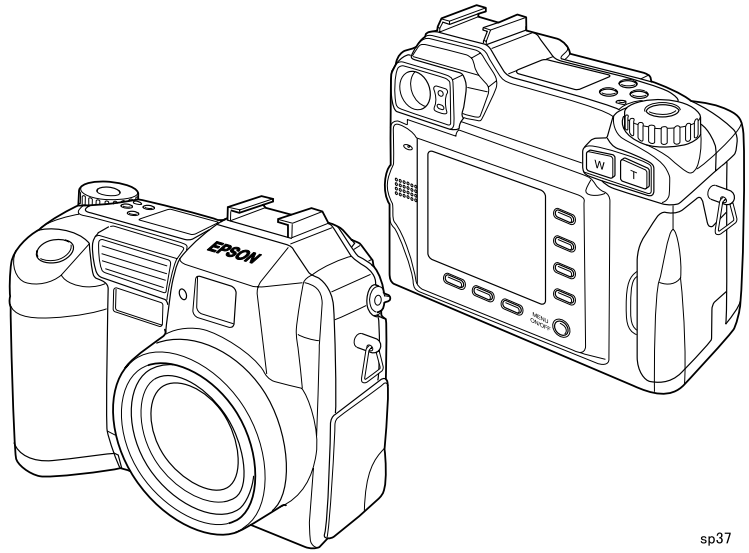


Figure 1-1. Exterior View

1.2 Functional Specification

Basic specifications of PhotoPC 3000Z is as follows.

1.2.1 Image Data

- Data Type: Compression: DCF (Exif)
  (DCF = Design rule for camera file system)
  Not compressed: DCF expansion (Tiff)
- Thumbnail Image: 160 x 120 pixels
- Image Size: 2544 x 1904 pixels (★★★H HyPict)
  2544 x 952 pixels (★★★H Panorama HyPict)
  2048 x 1936 pixels (★★★ Super Fine/ ★★ Fine)
  2048 x 768 pixels (★★★ Panorama Super Fine/ ★★ Panorama Fine))
  640 x 480 pixels (★ Standard)
  640 x 240 pixels (★ Panorama Standard)
- Color: Full color (24bit full color)/ Monochrome

1.2.2 Optics

- CCD: 1/1.8 inch color area CCD, inter race reading, complementary color filter
  Total pixels: 3.34 Mega pixels (2140 x 1560)
  Effective pixels: 3.24 Mega pixels (2088 x 1550)
- Lens: Collapsible 3 times zoom lens
  f=7-21mm
  (equivalent to a 34-102mm lens on a 35 mm camera)
  Brightness: F2.0 (W) - F2.5 (T)
  7 elements in 9 groups (2 aspheric surface lenses)
  *How to control collapsible lens is described later.
- Aperture: F2.0, F2.3, F2.8, F4.0, F5.6, F8.0 (6 apertures in total)
- Viewfinder: Real-image optical finder (view range about 83%)
  AF target mark indicates a targeting are for focusing.
  Visibility adjustment.
  No macro frame.
- Focus: Auto focus / Manual focus
- Focusing range: 0.2-0.5m (Macro mode)
  0.5m to infinity (Normal mode)
- Shutter: Electric iris with mechanical shutter
  - When flash mode is auto or compulsion:1/30 to 1/750* second
  - When flash mode is slow sync.: 1/2 second to 1/750* second
  - When flash mode is off: 1/2 -1/750* sec

  *: When the aperture is open, shutter speed is up to 1/1500 sec.

CAUTION

- **When taking photos of low contrast materials or of low illuminated materials, the automatic focusing function may not work correctly. (Especially when flash is needed.)**
- **When the automatic focusing function does not work correctly (when the function fails to measure the distance), it sets the distance at 1.5m (TBD) automatically.**

1.2.3 Shooting Mode

- Exposure adjustment
  - Polytomy photometry programmed AE
    (Aperture and shutter speed are variable.)
  - Spot measuring programmed AE
    (Aperture and shutter speed are variable.)
  - Manual adjustment available
    (-2EV to +2EV, 0.5EV/0.2EV step)
  - Fixed setting mode available
    (Aperture, shutter speed, sensitivity, W/B can be fixed.)
- Sensitivity:
  - ISO 100 (TBD) equivalent (at Normal mode)
  - ISO 200/400 equivalent (TBD) High sensitivity shooting mode available
- White balance
  - TTL auto white balance

- Fixed mode available
  (only under the sun light, color temperature: 5200K)
- User record setting mode available

☐ LCD shooting

- TTL image play (Playback rate 1/30 sec, in dark condition: 1/10 sec)
- A visual field covers more than 98% of a capturing image field.

☐ Finder shooting
Unlike previous models, PhotoPC 3000Z indicates menu on LCD if MENU button is pressed at shooting. This new function allows user to check and change current settings.

CAUTION

- **Note the through image will not be displayed on LCD (it will be blue back.) and thereby, macro, panorama and digital zoom shooting is not available since they requires framing check.**
- **LCD will be automatically turned off 15 seconds after the last button operation. LCD will also be turned off when MENU button is pressed again or when the half shutter is used.**

☐ Self timer: 10 seconds (fixed)

- When the self timer button is pressed, count down starts when shutter button is pressed.
- The count down stops wen the self timer button is pressed during count down.
- After the picture is taken, it returns back to normal shooting mode.

☐ Macro mode: shooting range = 20cm to 50 cm.

☐ Quick shooting

Table 1-1. Quick Shooting

After shooting indication	Transferring method
Indicating confirming image (2 sec)	It indicates freeze image for 2 sec. and performs CF transfer. Then it indicates through image which means the camera is ready to take pictures.
Recording	After recording, it performs CF transfer along with audio files.
Shifting to simple playback mode	After performing CF transfer, the camera returns to simple playback display. During the CF transfer, it indicates freeze image.

NOTE: *When there is no restrictions, CF transfer is always performed.*

Conditions that the camera does not become shooting mode after CF transfer is completed.

- *Continuous shooting*
- *Interval shooting*
- *Hypict shooting*

If the camera is set to record after shooting;

- *When batteries are low (when the power is supplied from batteries.)*
- *When buffer memory becomes full.*
  (If the buffer memory has space even for one photo, the camera allows the next picture taking.)
- *When CF card memory capacity is not enough.*
- *When transferring the pictures taken by fixed exposure.*
- *Any other conditions that transferring to CF should be given priority.*

☐ Continuous shooting
The camera continues taking pictures while the shutter button is pressed.

- Full-size: approx. 1.5 images / second (TBD)
- VGA: approx. 2 images / second (TBD)

- Continuous shooting is available up to TBD.
- Flash is set Off forcibly.

☐ Digital Zoom
Digital x2 zoom function
It stores images, adjusting the image quality to the image size of each recording mode.
It means as follows;

★:	640 x480
★★,★★★,★★★^{H} (TIFF):	2048 x 1536
★★★^{H}:	2544 x 1904

☐ Panorama

★:	640 x 240
★★,★★★,★★★^{H} (TIFF):	2048 x 768
★★★^{H}:	2544 x 952

☐ Monochrome
Available at ★,★★,★★★,★★★^{H} (TIFF),★★★^{H}

☐ Interval shooting

- Shooting minimum interval; 10 seconds
  (At Hypict and recording setting; 20 seconds)
- Shooting maximum interval; 24 hours
- Shooting setting interval; Setting available by 1 second in increments

☐ Full auto shooting
The camera decides various setting automatically. User only can change strobe setting and select pictures.

- Polytomy photometry
- ISO sensitivity: 100 (TBD)
- White balance: AUTO
- Exposure adjustment is not available

☐ Program shooting
The following 4 program modes are selectable.

- Normal
  Normal program
  Polytomy photometry
- Sports
  This mode is for taking a rapidly-moving object. This mode is suitable for sports scene.
  High speed shutter is used along with increased sensitivity.
  Polytomy photometry
- Portrait
  This mode is suitable for taking a human being.
  It is programmed to take a picture with an aperture open so that the back ground will be blurred. Therefore, a warning will be indicated when it will be over exposed.
  Spot photometry
  Reduce sharpness of image
  Changes γ. (TBD)
- Landscape
  This mode is suitable for taking landscape.
  This is programmed to give priority to aperture (narrows the aperture as much as possible) so that the depth of the object will be deepen.
  Polytomy photometry
  Increase sharpness of the image.
- Exposure adjustment (0.5EV step), ISO sensitivity and W/B selection are available

☐ Manual shooting
Auto exposure / aperture priority / manual exposure / fixed setting (TBD) is selectable.

- Auto exposure
  Exposure adjustment (0.2EV step), Photometry method, ISO sensitivity, W/B setting and Focus (AF or manual) are selectable.
- Aperture priority program AE
  Aperture, Exposure adjustment, Photometry method, ISO sensitivity, W/B setting and Focus (AF or manual) are selectable.
- Manual exposure
  Aperture, Shutter speed, Photometry, ISO sensitivity, W/B setting and Focus are selectable.
- In any modes, if the proper exposure cannot be set, EV warning will be indicated.

- Choice of shutter speed (TBD)
  4, 1/2, 1/3, 1/4, 1/4.5, 1/5, 1/5.5, 1/6, 1/6.5, 1/7, 1/7.5, 1/8, 1/9, 1/10, 1/11, 1/12, 1/14, 1/15, 1/16, 1/17, 1/19, 1/21, 1/23, 1/25, 1/27, 1/30, 1/32, 1/35, 1/39, 1/42, 1/45, 1/50, 1/55, 1/60, 1/65, 1/70, 1/80, 1/85, 1/90, 1/100, 1/110, 1/120, 1/130, 1/140, 1/150, 1/170, 1/180, 1/200, 1/125, 1/230, 1/250, 1/280, 1/300, 1/330, 1/360, 1/400, 1/430, 1/470, 1/500, 1/550, 1/600, 1/670, 1/750, 1/800
- Choice of aperture
  F2.0, F2.3, F2.8, F4.0, F5.6, F8.0

1.2.4 Playback Mode

- Normal replay
  Picture image displayed by switching.
- Split display
  No split display (normal), 4 images, 9 images are selectable.
- Magnification display
  Magnify an image x2. Smooth scrolling available.
- Deletion
  1 image deletion, selected images deletion and all images deletion are selectable.
- Lock
  Selected images can be locked.
  Locked images cannot be deleted until lock is cancelled.
- Detailed information
  Image No., Date, Shutter speed, Aperture, Exposure adjustment, Flash, White balance, Photometry, Macro, Digital zoom and ISO sensitivity are indicated.
- Slide show
  Image selection, image rotation, image display interval selection (3 sec, 5 sec, shuffle, manual) and synchronous sound replay are available.
- Sound replay/ After-recording
  Playback: can be stopped halfway.
  After-recording: max. 10 sec is possible. (can be stopped halfway)
- Simple playback function
  When the camera is on the shooting mode, it can be turned to the playback mode temporarily. This function allows user to check the image after shooting without stress.
  Only the following functions are available for simple playback.
  Normal replay, Split display, Magnification display, one image deletion and sound replay.
- Video recording
  Selection of video recording (when there are many), playback, synchronous sound replay, deletion of video recordings are available.
  (Refer to “Video Recording Mode” on page 15)

1.2.5 Set Up Mode

- Language selection
  Japanese, English, French, German, Italian, Portuguese, Spanish, Chinese
- Date setting
  01/01/2000 00:00 (default)
  (Japan and China Y.M.D, others M.D.Y)
- Shoot mode setting
  Full auto, Program and Manual are selectable.
- Color / Monochrome
  Color shooting / Monochrome shooting are available
- Date setting
  01/01/2000 00:00
  (Japan and China Y.M.D, others M.D.Y)
- Shoot mode setting
  Full auto shooting, program shooting, manual shooting are selectable.
- Camera setting
  Power save function, Brightness of LCD monitor setting
  Speaker volume (Hi / Low)
  Beep sound setting (Always / Shutter / Never)

- Memory setting
  Compact Flash memory Card format, DCF directory setting, expanded functions Add / Delete
- Video signal selection
  NTSC / PAL

1.2.6 Video Recording Mode

- Recording
  - Maximum 25 seconds continuous shooting
  - When the video recording is enabled, by pressing the shutter button, the shooting will be started.
  - Pressing shutter during video recording will end recording.
  - Simultaneous voice recording
  - Zoom operation available during video recording. (digital zoom is not available.)
  - Format: motion JPEG for QTM. PAL is 12.5 frame/ sec.
- Playback
  - Video and sound playback are available

1.2.7 Sound Mode

- Recording
  - Sound recording and after recording are available.
  - Recording time: Max. 10 sec.
  - Cut off amid of sound recording is available
- Playback
  - Sound playback is available.
  - Volume can be adjusted. (High/ Low)

1.2.8 Communication with PC

- Dial switch position at communicating with PC
  - Unlike previous models, PhotoPC 3000Z requires to set the dial switch to “Operation”. (Serial/ USB)
  - Sunk control of the lens from PC and shooting from PC is possible at “Operation” mode.
- Communication command
  TBD
- Serial communication speed
  See “4-18interfaceaa”. TBD

1.2.9 Memory

- Internal RAM Memory: 16 MB
- Internal ROM memory: 2 MB (Program Only)
- Image Memory:
  - Compact Flash Memory Card
  - CF card access: up to 200MB (TBD)
  - PC-DOS format: 512 B/Sector
  - 16bit FAT (Up to 64 MB) (TBD)

1.2.10 Internal Lock

- ☐ Internal clock
  - ■ Internal clock is built-in
  - ■ Record the shooting date and time on the image
    (Month / Day / Year, Hour / Minute / Second)
  - ■ Date is held by the super-capacitor at the battery exchange.
    -When super-capacitor is charged full: date is held for about 2 hours.
    -To charge super-capacitor full, at least 4 hours required by battery connection or AC adaptor connection.
    When charging the camera, you do not have to turn the camera on.
    (TBD)

1.2.11 Miscellaneous

- ☐ Lens cap
  Removed and installed manually.

NOTE: *With lens cap on, you cannot turn on the camera on the shooting mode. Lens cap prevent the lens from veering out. Playback and other operations are possible with the lens cover on.*

- ☐ Internal flash
  Auto (pre-flash method auto tone adjustment) / Off / Forced flash / Red eye reduction / Slow synchro (for night view. user can select either trailing or leading flash.)
- ☐ Effective flash range
  - ■ Normal mode: 0.5 - 2.4m
  - ■ Macro mode: 0.2 - 0.5m

It causes over-exposure if you take photos with strobe for a subject within 0.2m on macro mode.

1.3 Indication

1.3.1 Overview

- ☐ LCD monitor
  - ■ 1.8 type low temperature poly-silicon TFT color LCD
  - ■ Wide view type
  - ■ 1.1 M pixels: 512 x 218 pixels
  - ■ A visual field covers more than 98% of the capturing image field.
  - ■ Displaying taken images at the playback mode: 100% of an image field is displayed.
- ☐ Beep sound / Shutter sound
  Always / Only for shooting / None are selectable
- ☐ Self-timer
  - ■ Front side red LED indication
    -First 8 seconds: slow blinking
    -Last 2 seconds: high speed blinking
- ☐ Control LCD panel
  - ■ Monochrome LCD
  - ■ Indicates the numbers of images more can be taken. (3 digits)
  - ■ Indicates aperture at half-shutter
    (only for program / manual mode)
  - ■ Indicates shutter speed at half-shutter
    (only for program / manual mode)
  - ■ Indicates exposure adjustment
  - ■ Indicates resolution of image (including Monochrome and HyPict)
  - ■ White balance
  - ■ Sensitivity
  - ■ Self timer mark
  - ■ Flash mode
  - ■ Battery warning mark
- ☐ View Finder (VF) side lamp
  - ■ Green signal (On / Blink / Off)
  - ■ Red signal (On / Blink / Off)

  See “LCD Panel Indication” below.

1.3.2 LCD Panel Indication

The Panel indication is explained below.

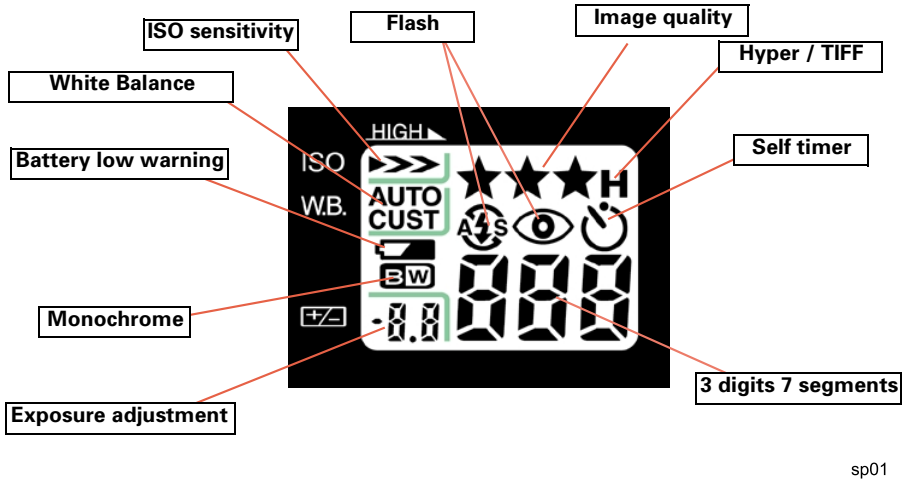


Figure 1-2. Panel Indication

ICONS

The table below explains the function of the icons on LCD.

Table 1-2. Icons

Icon	Explanation
ISO sensitivity	Indicates the current level of ISO sensitivity.
White balance	Indicate the current level of white balance.
Battery low warning	Indicated when the battery gets low.
Exposure adjustment	• Indicates exposure adjustment. • Indicates aperture. (Not applicable at half shutter and full auto setting.)
Image quality	Indicates image quality (resolution).

Table 1-2. Icons

Icon	Explanation
Hyper / TIFF	Hypict mode or TIFF
Monochrome	Indicated at the monochrome mode.
Self timer	Indicated at the self timer shooting mode.
Flash	Indicates the strobe setting.
3 digits 7 segments	• Indicates the number of pictures more can be taken. • Indicates shutter speed. (Not applicable at half shutter and full auto setting.) • Indicates other mode settings.

1.3.2.1 3 Digits 7 Segments -- Specification

STILL IMAGE SHOOTING (VF, LCD, CONTINUOUS SHOOTING)

- ☐ Indicates the number of pictures more can be taken on the current image quality (resolution).
- ☐ Indicates shutter speed on half-shutter. (Not applicable for full auto.)
- ☐ When writing into the compact flash memory, the segment is indicated as follows.

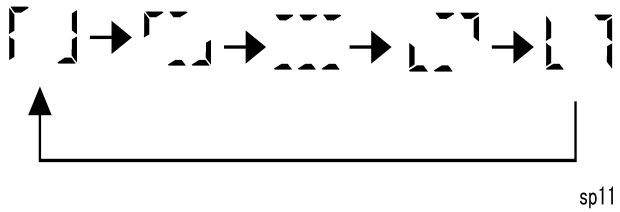


Figure 1-3. Writing into Compact Flash Memory

INTERVAL SHOOTING

- ☐ Indication is the same as still image shooting until shooting started.
- ☐ Indication is the same as still image shooting while writing into the compact flash.

☐ The figure below is the indication on the standby mode at the interval shooting.

sp12

Figure 1-4. Interval Shooting Indication

VIDEO RECORDING

☐ Normal
Indicates the number of video recordings more can be recorded.
(25 seconds is counted as 1 film.)

☐ During video recording
Indicates how long you can record more. (seconds)

☐ While writing into the compact flash memory.
Indication is the same as still image shooting.

PLAYBACK, EXPANSION MODE

Indication is as shown below.

sp13

Figure 1-5. Playback and Expansion Mode

COMMUNICATING WITH PC

Like EPSON previous models, ★ scrolls.

RECORDING

Indication is as shown below.

sp14

Figure 1-6. Recording

SET UP

Indication is as shown below.

sp15

Figure 1-7. Set Up

1.3.2.2 ISO Sensitivity

The following is the ISO sensitivity indication.

☐ **Standard** ▶

☐ **Fine** ▶▶

☐ **Super fine** ▶▶▶

sp16

Figure 1-8. ISO Sensitivity

1.3.2.3 White Balance

STILL IMAGE SHOOTING / VIDEO RECORDING

☐ White Balance = Auto
Indicates AUTO

☐ White Balance = Custom
Indicates CUST

☐ White Balance = Fixed
No indication.

OTHER SITUATIONS

No indication.

1.3.2.4 Battery Low Warning

☐ Battery is enough
No indication

☐ Battery is low
Battery low icon appears.

☐ Battery is almost out
Battery low icon blinks and then the camera will be shut down.

1.3.2.5 Exposure Adjustment

FULL AUTO SHOOTING

No indication.

PROGRAM / MANUAL SHOOTING

☐ Indicates exposure adjustment value.

☐ Only at half shutter, indicates aperture.

OTHER SITUATIONS

No indication.

1.3.2.6 Image Quality (Resolution)

Image quality changes as shown below each time the image quality button is pressed.

★★ → ★★★ → ★★★^{H} → ★ → ★★

NOTE: *When the mode is continuous shooting, the image quality setting skips ★★★^{H}.*

NOTE: *On the video recording, there is no indication of image quality.*

1.3.2.7 Monochrome

Monochrome icon is indicated only on the monochrome shooting mode.

1.3.2.8 Self Timer

☐ Press the self timer button on the shooting mode to set the self timer.

- Self timer icon will be indicated.
- Press the shutter button.
  The self timer icon will be blinking for 10 seconds.

☐ Other modes (not shooting mode)
No indication

☐ Press the self timer button while the self timer icon is on. Self timer icon will be off.

1.3.2.9 Flash

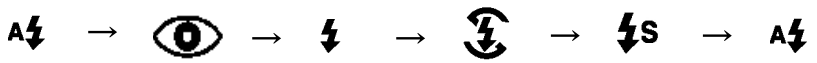
Press the flash button on the shooting mode. The icon will be switched as shown below.

☐ Full Auto Shooting

sp17

Figure 1-9. Flash Indication (Full Auto)

☐ Program / Manual Shooting



sp18

Figure 1-10. Flash Indication (Program / Manual)

- Continuous / Video Shooting
  Flash cannot be used. The icon below is indicated.

Figure 1-11. Flash Forbidden Icon

- Other situations
  No indication.

1.3.3 LED Condition

See the table below for the LED condition.

Table 1-3. LED Condition

	Shooting LED Red	Shooting LED Green	Front LED
Ready to shoot		ON	
Focusing		Blinking (0.2 sec)	
Focus lock		ON	
CF is full	Blinking (0.5 sec)		
Battery Low	Blinking (1.0 sec)		
Error	ON		
Self timer		ON	First 8 sec: low speed blinking (0.5 sec) Last 2 sec: high speed blinking (0.2 sec)
Video shooting		Blinking (1.0 sec)	
Power on (standby)		Blinking (0.2 sec)	
With lens cap on		Blinking (0.2 sec)	
CF is not inserted.		Blinking (0.2 sec)	

1.3.4 LCD Monitor

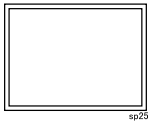
LCD monitor has the color frames indication according to respective functions and these frames are indicated only on the LCD shooting mode and on the special continuous shooting mode.

NOTE: *The priority of the color frame indication is as follows. Monochrome (Blue) < Macro (Green) < Digital zoom (Yellow) < Continuous Shooting (Red) < Video (White)*

Table 1-4. Color Frame

Color Frame	Mode	Note
	Standard	
sp20	Macro	"MACRO" is indicated for seconds.
sp21	Monochrome	"MONOCHORME" is indicated for seconds.
sp22	Digital zoom (x2)	"DIGITAL ZOOM" is indicated for seconds.
sp23	Panorama	"PANORAMA" is indicated for seconds.

Table 1-4. Color Frame

Color Frame	Mode	Note
sp24	COntinuous Shooting	
 sp25	Video	

1.4 Operation

1.4.1 Switch / Button

Table 1-5. Switch / Button List

Switch / Button		Indication	Meaning / Functions
Dial switch		sp26	Special shooting mode
		sp27	LCD shooting mode
		sp28	VF shooting mode
		sp29	Playback mode
		sp30	Expansion / PC connection mode
		Set up	Set up mode
Shutter switch		No indication	Shutter
Zoom switch		W,T	Zoom selection
Visibility adjustment dial		No indication	Adjust visibility
Power SW		POWER	Power ON / OFF
Control button (Top)	Image quality button (resolution)	★	★/★★/★★★/★★★H switching
	Flash button	sp31	Flash function switching
	Self timer button	sp08	Self timer

Table 1-5. Switch / Button List

Switch / Button		Indication	Meaning / Functions
Menu button (Back)	1 button	No indication	Select menu
	2 button	No indication	Select menu
	3 button	No indication	Select menu
	4 button	No indication	Select menu
	A button	No indication	Select menu
	B button	No indication	Select menu
	C button	No indication	Select menu
	F button	MENU ON/OFF	Menu indication ON /OFF

1.4.1.1 Button Layout

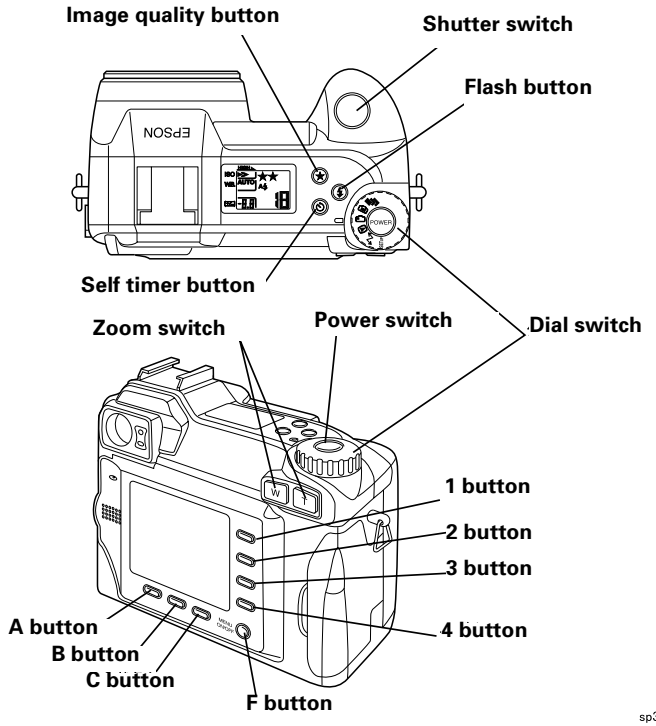


Figure 1-12. Button Layout

1.4.2 Sinking Lens Control

CONDITIONS TO MOVE THE LENS FORWARD

- ☐ When the camera is set ready to take picture with the lens sunk. (When powering ON the camera or when mode is switched by dial switch.)
- ☐ When the camera received the command from the PC to move the lens forward.

CONDITIONS TO SINK THE LENS

- ☐ When powering OFF the camera with the lens craned.
- ☐ When the camera received the command from the PC to sink the lens.

1.4.3 Setting Stored

You can store setting in the camera and these data are classified into three levels: A to C.

- ☐ Rank A
  Data are stored in the flash ROM and remained until complete reset.
  - ■ Emulation setting
    Including NTSC/ PAL.
  - ■ When the emulation setting is cleared:
    Indicates the emulation setting menu when LCD is on.
- ☐ Rank B
  Data are stored until the back-up in the super capacitor becomes invalid.
  - ■ Resolution switching
  - ■ Flash switching
    Program / Manual
  - ■ Various settings on the SETUP mode
    Not including the setting command.
  - ■ Photometry method
  - ■ Values on manual
    Shutter speed / Aperture / Focus
  - ■ Slide show setting
  - ■ Date setting
    When date is cleared: indicates date setting menu when LCD is on.
  - ■ W/B custom setting
  - ■ Program
  - ■ Normal / Sports / Portrait / Landscape
  - ■ ★★★^{H} resolution
- ☐ Rank C
  Stored until the camera is turned off. Not including “off” of energy saving mode.
  - ■ Panorama / Macro / Digital zoom
  - ■ W/B setting
    AUTO / Fixed / Custom
  - ■ Exposure adjustment

1.4.4 Processing Time

Table 1-6. Processing Time (TBD)

Quality setting	Time required for writing into CF memory	Minimum time required to be ready to take another picture.	Playback processing time
Standard★			
Fine★★			
Super fine★★★			
TIFF★★★H			
Hyper★★★H		--	

NOTE: *Assumption: Super fine: 1MB / Fine: 500KB / Standard: 100KB*
Strobe charging time is not included in the figures above.

1.4.5 File Size and the Number of Pictures

1.4.5.1 File Size

Table 1-7. File Size (Reference Value)*

Quality setting	File size
Standard (640 x 480)	about 100KB [TBD]
Fine (2048 x 1536)	about 500KB [TBD]
Super Fine (2048 x 1536)	about 1MBKB [TBD]
Hypict (2544 x 1904)	about 1.5MB [TBD]
TIFF (2048 x 1536)	9MB

NOTE: *The image data is compressed with JPEG format and the file volume varies according to the subject. The table above shows the average value.*

1.4.5.2 Average Number of Pictures Saved into CF Card

Table 1-8. Number of Pictures Saved in CF Card (Reference)

Quality setting	16M CF card
Standard (640 x 480)	[TBD]
Fine (2048 x 1536)	[TBD]
Super Fine (2048 x 1536)	[TBD]
Hypict (2544 x 1904)	[TBD]
TIFF (2048 x 1536)	[TBD]

NOTE: *The figures above are estimated on our measurement conditions and assumed no other files in CF card. If CF card stores other files, the number of pictures saved in CF card will be smaller.*
A captured image is stored with JPEG format and the image file volume varies according to the subject. The number of pictures saved in CF card may be smaller accordingly.

1.5 Interface

1.5.1 External Connection

The external connectors for PhotoPC 3000Z are as follows.

- ☐ Serial communication connector
- ☐ USB connector
- ☐ A/V output
- ☐ AC adapter
- ☐ Compact Flash

SERIAL COMMUNICATION INTERFACE

- ☐ Overview
  This is the exclusive serial interface that connects the camera with Windows / Mac. or printer. It is compatible with RS232C and exclusive cable is used for connection.
- ☐ Specification
  This is not open for users.
  - ■ Asynchronous
    Application: For image transfer or camera control
    Standards: RS-232C TXD, RXD, GND (3 lines)
    Bit length: 8 bit
    Parity check: Non parity
    Transfer rate: 19200 / 38400 / 57600 / 115200 / 230400 bps
  - ■ Synchronous
    Application: For DirectPrint
    Standards: RS-422, 423
    Bit length: 8 bit
    Parity check: Non parity
    Transfer rate: 230 kbps to 1.8 Mbps
- ☐ Connector Pin Configuration

Table 1-9. Connector Pin Configuration

Pin #	Signal	I/O	Explanation
1	VDD3	O	Used by conversion cable for DirectPrint. Max. 20 mA
2	HSKO	O	RTS
3	HSKI	I	CTS
4	GPI	I	Mac. serial clock input
5	TXD-	O	Differential transmission signal output minus side RS-232C TXD
6	TXD+	O	Differential transmission signal output plus side
7	RXD-	I	Differential reception signal output minus side RS-232C RXD
8	RXD+	I	Differential transmission signal output plus side
9	DINCNT	I	Cable connection detector terminal. Cable detection at “L”.
10	GND	-	GND
SHELL	-	-	SHELL

USB INTERFACE

Table 1-10. Connector Pin Configuration

Pin #	Signal	I/O	Explanation
1	VDD	I	Power
2	D-	I/O	Data signal
3	D+	I/O	Data signal
4	GND	-	GND
SHELL	-	-	SHELL

NOTE: *The connector is the exclusive small connector made by MITSUMI, which uses exclusive USB cable.*

A/V OUTPUT

- ☐ NTSC / PAL
  Switched by SETUP menu
- ☐ Use exclusive A/V cable

Table 1-11. Connector Pin Configuration

Pin #	Signal	I/O	Explanation
1	VOUT	O	Video output
2	AOUT	O	Sound output
3	GND	--	GND

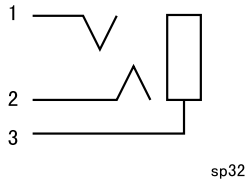


Figure 1-13. Connection Diagram

AC ADAPTER INPUT

- ☐ AC adapter exclusive DC input terminal (7.0V)
- ☐ Polarity: Center plus
- ☐ EIAJ Type2 ϕ4.4 mm
- ☐ AC Adapter: EU-40, 7V2.0A

COMPACT FLASH

- ☐ CompactFlash Interface
- ☐ CompactFlash Card Type1 supported

1.5.2 Exclusive Cable

This section explains the connection information of cables exclusive for PhotoPC 3000Z.

1.5.2.1 Serial Cable (for Windows)

This serial cable is exclusive for PhotoPC 3000Z.

Table 1-12. Serial Cable Specification

	Specification
Length	1.5mm
Connector	• Camera side: manufactured by HIROSE, 10 pin connector (male) • PC side: 9 pin DSUB (female)

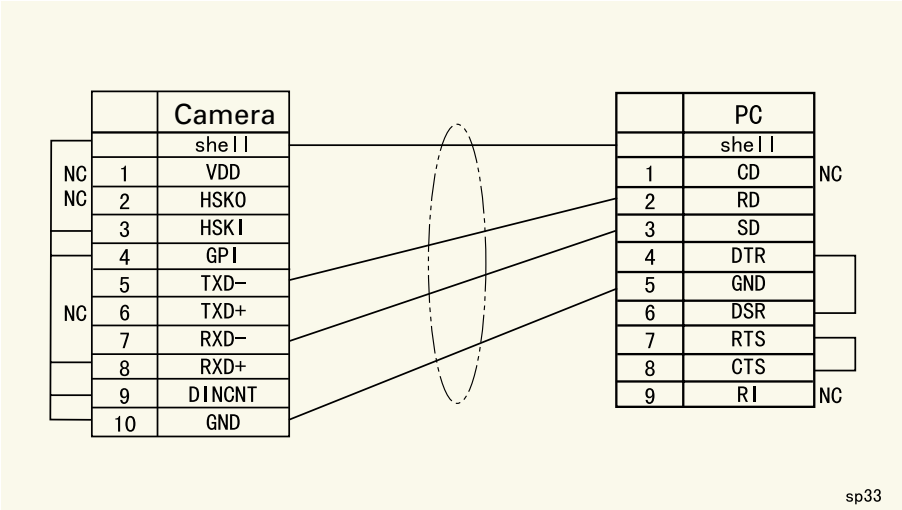


Figure 1-14. Serial Cable Connection Diagram

1.5.2.2 Mac. Serial Cable

This serial cable is exclusive for PhotoPC 3000Z.

Table 1-13. Mac.Serial Cable Specification

	Specification
Length	1.5mm
Connector	• Camera side: manufactured by HIROSE, 10 pin connector (male) • PC side: 8 pin DIN (male)

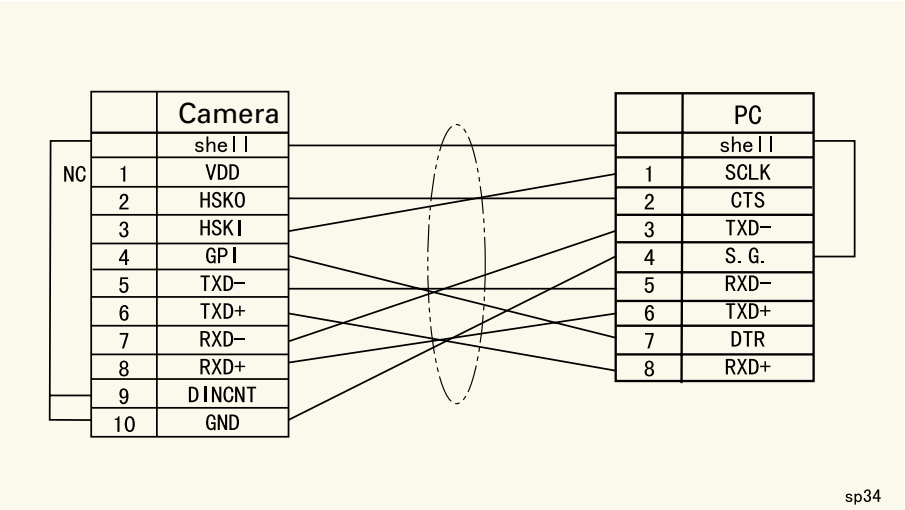


Figure 1-15. Mac. Serial Cable Connection Diagram

1.5.2.3 USB Cable

This USB cable is exclusive for PhotoPC 3000Z.

Table 1-14. USB Cable Specification

	Specification
Length	1.5mm
Connector	• Camera side: manufactured by HIROSE, 10 pin connector (male) • PC side: 9 pin DSUB (female)

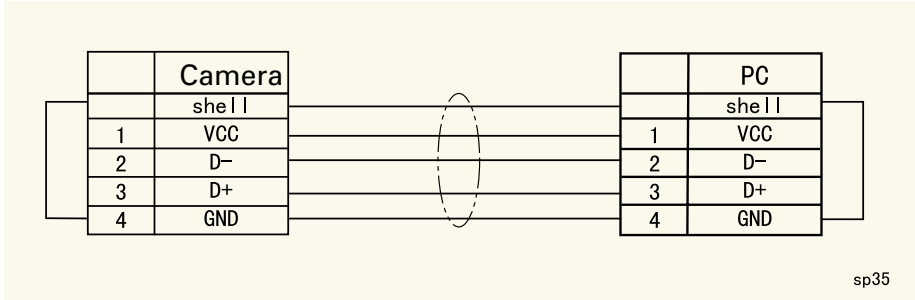


Figure 1-16. USB Cable Connection Diagram

1.5.2.4 A/V Cable

Table 1-15. A/V Cable Specification

	Specification
Length	1.5mm
Connector	• Camera side: ϕ3.5, Stereo plug • Video side: PCA plug (video: yellow, sound: white)

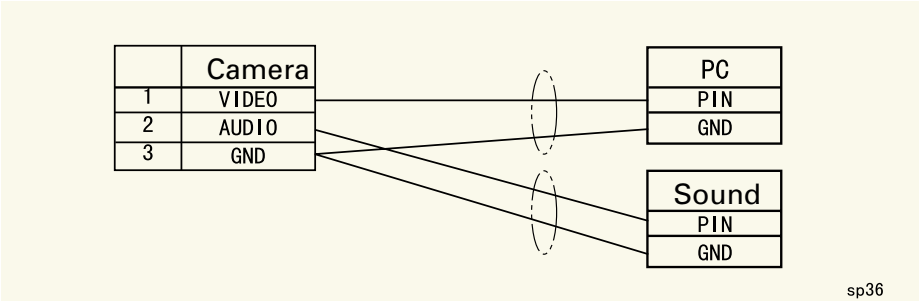


Figure 1-17. A/V Cable Connection Diagram

1.6 Power Supply

1.6.1 Battery

BATTERY SPECIFICATION

- ☐ AA Size: 4 AA size batteries are needed
- ☐ Ni-HM charging battery / Ni-Cd charging battery / Alkaline battery / Lithium battery

NOTE: *Mangan batteries must not be used.*

AC ADAPTER

Exclusive AC adapter must be used.

- ☐ EU-40
  7.0V, 2.0A

1.6.2 Battery Life (TBD)

Table 1-16. Battery Life

	Alkaline Battery	Ni-HM Battery (1500mAH)
LCD Shooting		
VF Shooting		
Playback		

NOTE: *The figures above are estimated on our measurement conditions.*
LCD shooting: energy saving mode 1, 50% strobe, image quality, when CF is full, delete images by PC, shooting interval 1 min. (after recovering LCD, shooting 10 sec. later)
VF shooting: 50% strobe, image quality ★★, when CF is full, delete images by PC, continuous shooting
Playback: set the energy saving mode for more than 1 min. and switches images at 1 min. interval.

1.6.3 Energy Saving Function

APPLICATION

- ☐ Only when powering by batteries
- ☐ When AC adapter is used: 15 min.

SHOOTING WITH LCD OFF

Shut down after 1min. apart from energy saving mode setting.

SHOOTING WITH LCD ON

- ☐ Energy saving mode: 10 seconds
  Shut down after 10 seconds
- ☐ Energy saving mode: 30 seconds
  Shut down after 30 seconds
- ☐ Energy saving mode: 1 minute
  Shut down after 1 minute
- ☐ Energy saving mode: 3 minutes
  Shut down after 3 minutes
- ☐ Energy saving mode: 5 minutes
  Shut down after 5 minutes

PLAYBACK MODE

- ☐ Energy saving mode: 10 seconds
  Shut down after 10 seconds
- ☐ Energy saving mode: 30 seconds
  Shut down after 30 seconds
- ☐ Energy saving mode: 1 minute
  Shut down after 1 minute
- ☐ Energy saving mode: 3 minutes
  Shut down after 3 minutes

- Energy saving mode: 5 minutes
  Shut down after 5 minutes

SLIDE SHOW

- Always shut down by after one-round of slide show.
- When all image is selected, it does not shut down until the battery runs out.

RECOVER

- When shooting pictures:
  Recover by half shutter or re-powering the camera.
- When not shooting pictures:
  Recover with pressing 7 button on the back or re-powering the camera.

1.7 Environment Condition

1.7.1 Performing Environment & Storing Environment

TEMPERATURE

- ☐ Performing
  5 to 35 °C
- ☐ Storing
  -20 to 60 °C

HUMIDITY

- ☐ Performing
  30 to 80% (without condensation)
- ☐ Storing
  10 to 80% (without condensation)

SHOCK RESISTANCE

- ☐ Storing
  G (TBD)

1.7.2 Power Supply Specification

DC INPUT VOLTAGE (AC ADAPTER)

- ☐ Min: Min. DC V (TBD)
- ☐ Max: Max. DC V (TBD)

MAXIMUM DC INPUT VOLTAGE

- ☐ Max: Max. DC V (TBD)

1.7.3 Assumed Performing Environment

- ☐ Environment
  Home, Office, Outside
- ☐ Water resistance
  Not supported

1.8 Safety Standard & Reliability

1.8.1 EMI, Safety Standard

- ☐ USA

  FCC part15 subpart B class B

- ☐ Canada

  CSA C108.8 class B

- ☐ Europe

  EMC Directive 89 / 336 / EEC

  EN55022 Class B

  (CE - marking)

  EN61000-3-2 (when AC adapter is used.)

  EN61000-3-3 (when AC adapter is used.)

  EN50082-1

  IEC801-2

  IEC801-3

  IEC801-4

- ☐ Europe

  EN55022 (CISPR Pub.22) class B

- ☐ Australia

  AS/NZS 3548 class B

- ☐ Taiwan

  EMI: CNS13438-C6357

- ☐ Japan

  VCCI Class B

- ☐ Korea

  The rule of Electromagnetic wave in Korea

1.8.2 Reliability Standards

1.9 Inhibitions and Cautions

- ☐ Never see the sun through the view finder
- ☐ Never use any AC adapters other than approved one.
- ☐ Never use any batteries other than approved one.
- ☐ Never insert batteries with incorrect polarity.
- ☐ Remove batteries, if the camera is not used for a long time.

CHAPTER

2

OPERATING PRINCIPLES

2.1 Board Component

The main component of this product is the electric circuit and lens assembly. The main components are shown in the figure below.

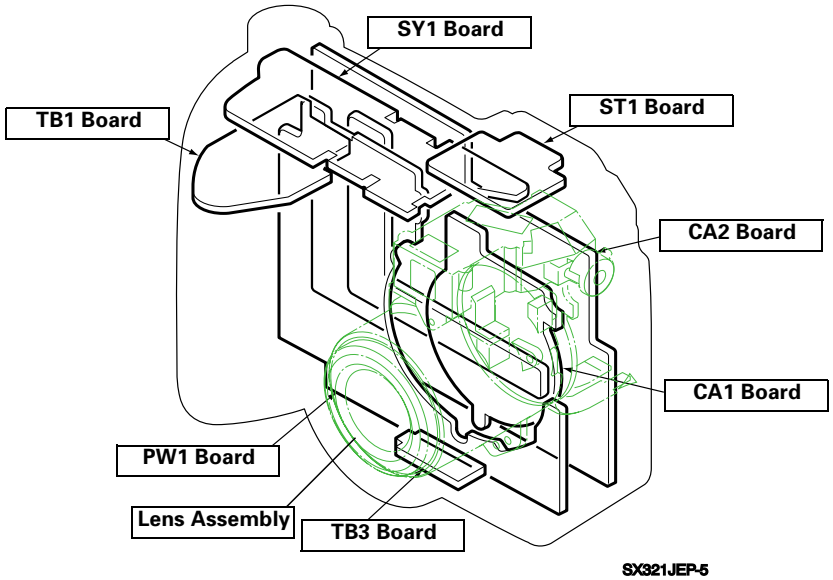


Figure 2-1. Main Component

The electric circuit is composed of CA1, CA2, SY1, TB1, TB3 and PW1 boards. The function of each board is explained below.

WARNING

Capacitor on the PW1 board is charged with strobe emission electricity and if you touch the capacitor terminal, you may receive electric charge. When you touch the board, handle it with the edge of the board and never touch the board surface. If you have to touch the board surface because of its service requirement, be sure to discharge the electricity of the capacitor. (Refer to Ch4.)

Table 2-1. Function of each board

Board	Functions
CA1	Inter line CCD image sensor • Control CCD clock. • Convert image data A/D
CA2	Composed of RISC-CPU, ASIC, 16M bit Flash-ROM, 64M bit SDRAM. • Control lens assembly. • γ correction. • Generate color signal • USB control • LCD driver • Audio AMP etc.
ST1	Hot shoe terminal
SY1	8 bit micro processor • Input control key • Mode LCD display • Clock management
PW1	☐ Electric circuit • Switching regulator • Digital 5V, analog power supply output • Digital 2.5V power supply output • LCD power supply output • Digital 3.35V power supply output • Back light power supply output ☐ Strobe circuit
TB1	Battery contact
TB3	Lens cover sensor

2.2 Circuit

The figure below is the circuit block diagram of PhotoPC 3000Z.

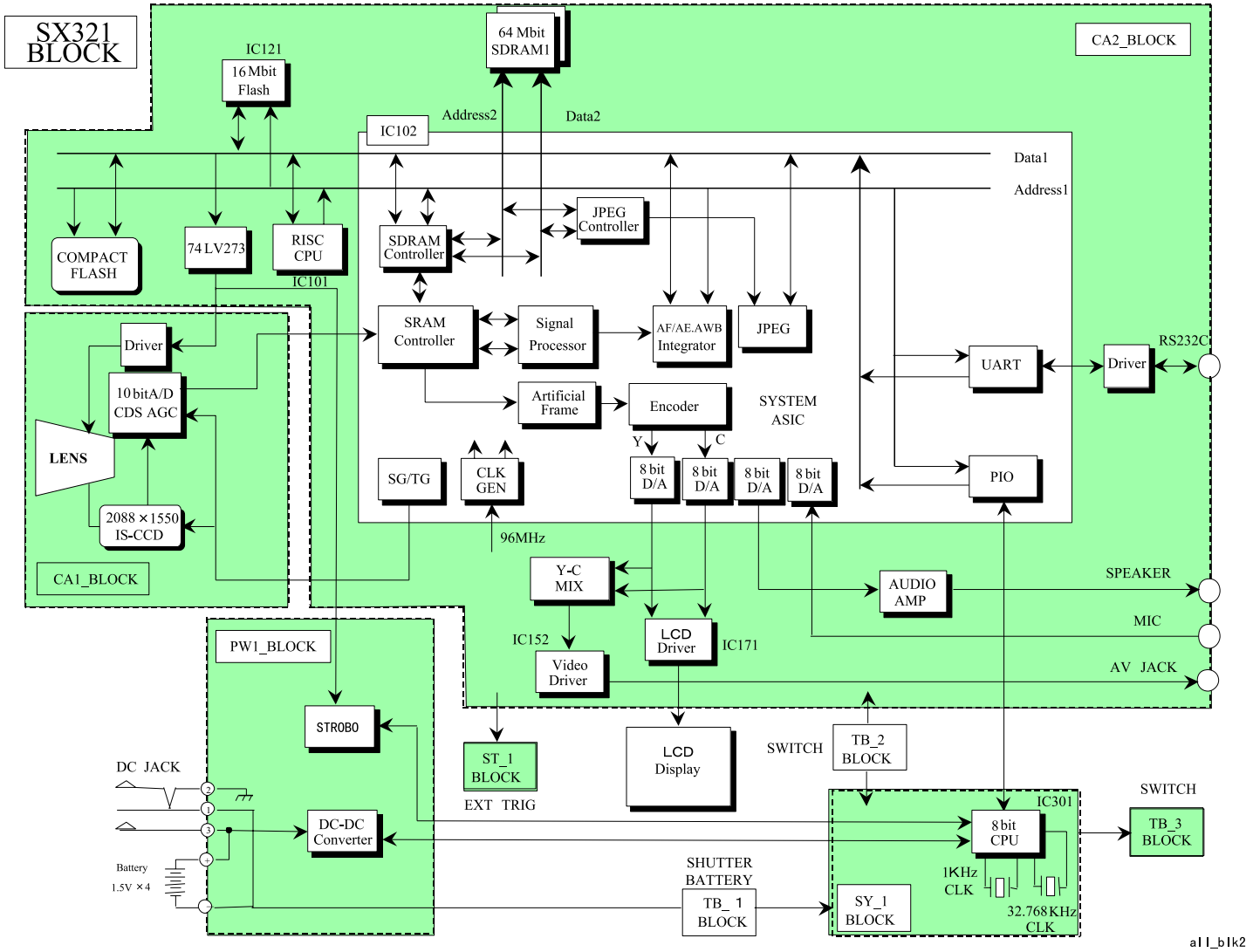


Figure 2-2. Circuit Block Diagram

2.2.1 CA1 Circuit Description

The figure below is the CA1 circuit block diagram.

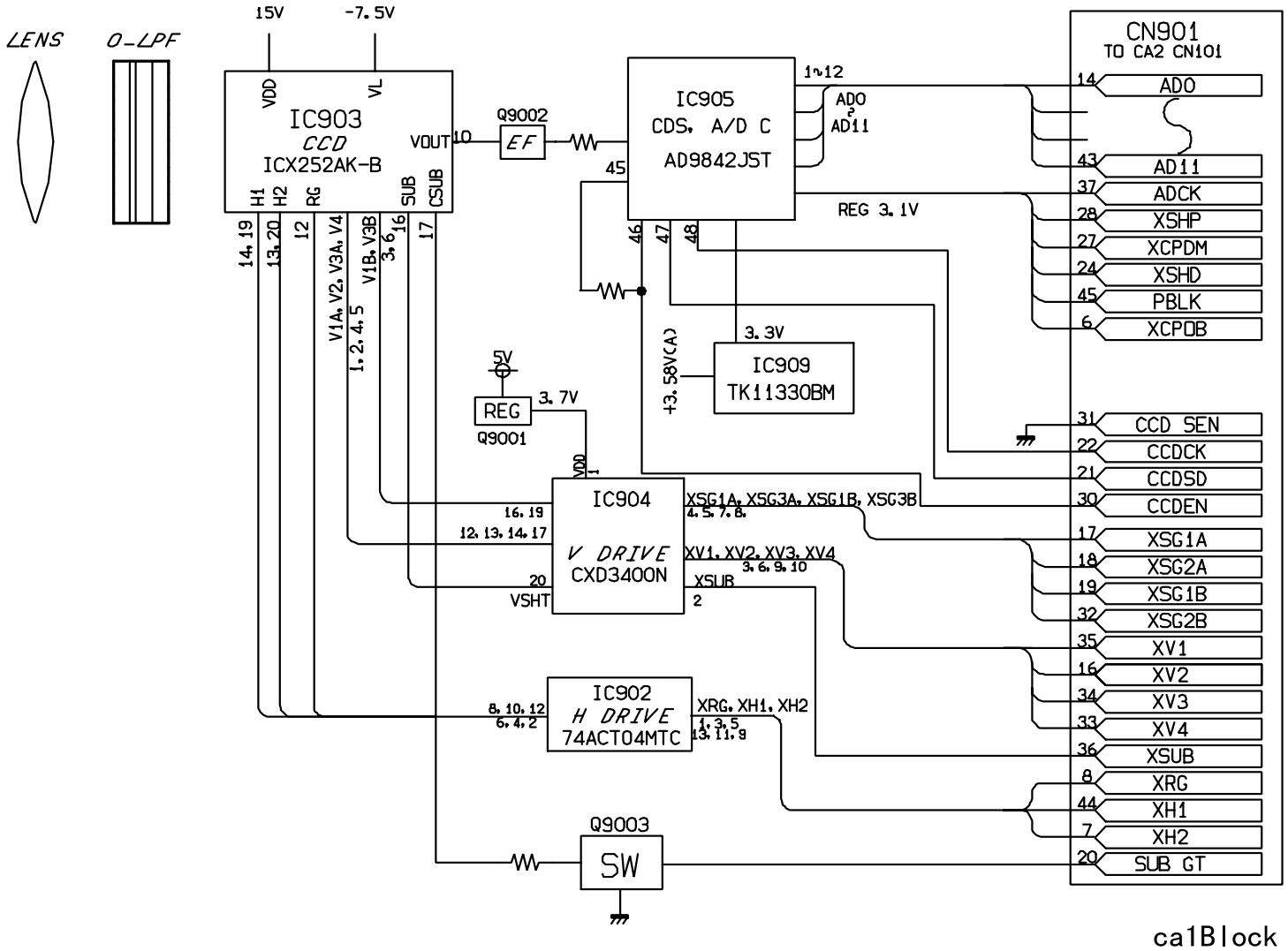


Figure 2-3. CA1 Circuit Block Diagram

2.2.1.1 Configuration

The CA1 board is mainly composed of the following ICs.

- ☐ IC903 (ICX252AK-B) : CCD imager
- ☐ IC902 (74ACT04MTC) : H driver
- ☐ IC904 (CXD3400N) : V driver
- ☐ IC905 (AD9842JST) : CDS, AGC, A/D converter

2.2.1.2 IC903 (CCD)

- ☐ Structure
  - ■ Interline type CCD image sensor
  - ■ Optical size : 1/108 type
  - ■ Effective pixels : 2088 (H) X 1550 (V)
  - ■ Pixels in total : 2140 (H) X 1560 (V)
  - ■ Optical black
    Horizontal (H) direction: Front 4 pixels, Rear 48 pixels
    Vertical (V) direction: Front 8 pixels, Rear 2 pixels
  - ■ Dummy bit number
    Horizontal: 28, Vertical:1 (only even number field)

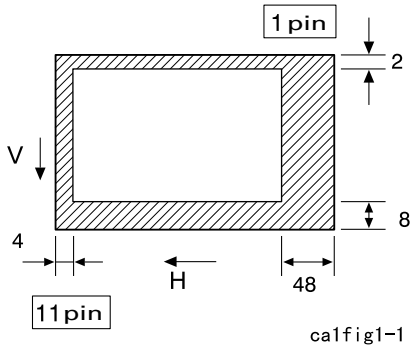


Figure 2-4. Optical Black Arrangement

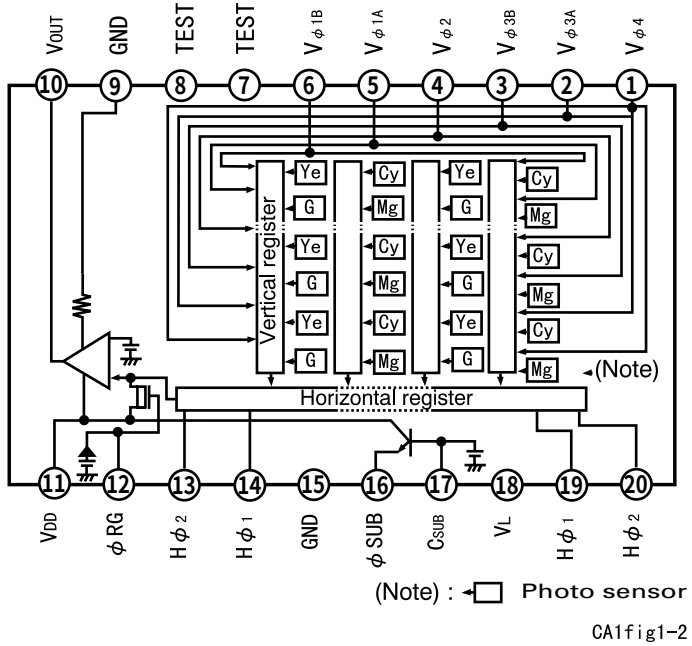
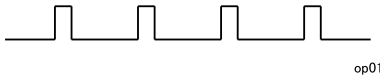
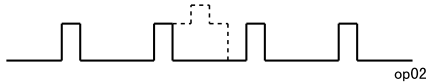
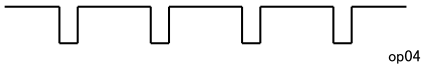
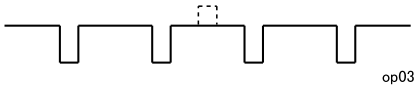
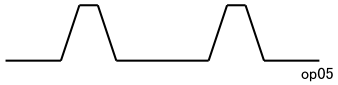
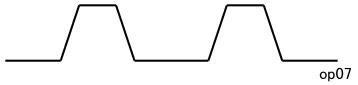


Figure 2-5. CCD Block Diagram

Table 2-2. CCD Pins Explanation

Pin No.	Symbol	Pin Description	Waveform	Voltage
1	V ϕ_4	Vertical resister transfer clock	 op01	-7.5V, 0V
2, 3	V ϕ_{3A}, V ϕ_{3B}	Vertical resister transfer clock	 op02	-7.5V, 0V, 15V
4	V ϕ_2	Vertical resister transfer clock	 op04	-7.5V, 0V
5, 6	V ϕ_{1A}, V ϕ_{1B}	Vertical resister transfer clock	 op03	-7.5V, 0V, 15V
9, 15	GND	GND	GND	0V
10	V_{OUT}	Signal output	-	Approx. 10V
11	V_{DD}	Circuit power supply	DC	15V
12	ϕ RG	Reset gate clock	 op05	12.5V, 16V
13, 20	H ϕ_2	Horizontal resister transfer clock	op06	0V, 5V
14, 19	H ϕ_1	Horizontal resister transfer clock	 op07	0V, 5V
16	ϕ SUB	Substrate clock	DC	Approx. 8V
17	C_{SUB}	Substrate bias	DC	Approx. 8V (Different in each CCD)
18	V_L	Protection transistor bias	DC	

NOTE: *"---" when sensor read-out*

2.2.1.3 IC902 (H Driver) and IC904 (V Driver)

An H driver (IC902) and V driver (IC904) are necessary in order to generate the clocks (vertical transfer clock, horizontal transfer clock and electronic shutter clock) which drives the CCD.

IC902 is an inverter IC which drives the horizontal CCDs (H1 and H2). In addition the XV1-XV4 signals which are output from IC102 are the vertical transfer clocks, and the XSG1 and XSG signal which is output from IC102 is superimposed onto XV1 and XV3 at IC904 in order to generate a ternary pulse. In addition, the XSUB signal which is output from IC102 is used as the sweep pulse for the electronic shutter, and the RG signal which is output from IC102 is the reset gate clock.

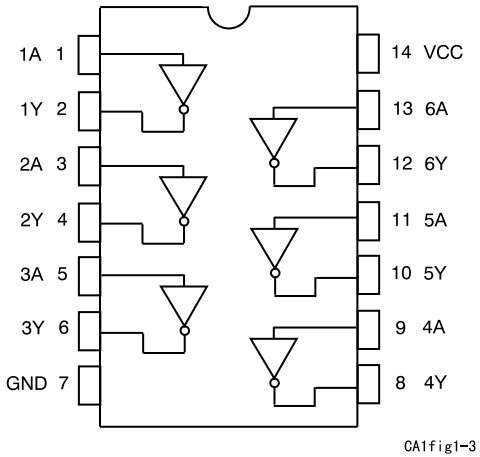


Figure 2-6. IC902 Block Diagram

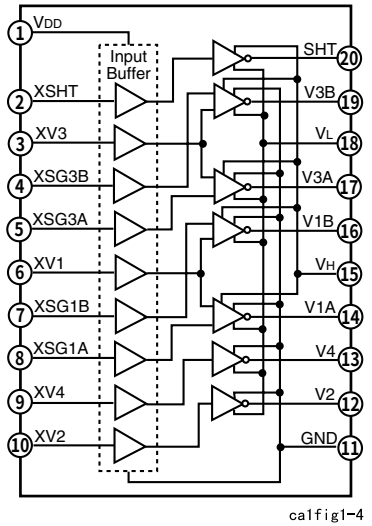


Figure 2-7. IC904 Block Diagram

2.2.1.4 IC905 (CDS, AGC Circuit and A/D Converter)

The video signal which is output from the CCD is input to Pins (30) of IC905. There are S/H blocks inside IC905 generated from the XSHP and XSHD pulses, and it is here that CDS (correlated double sampling) is carried out.

After passing through the CDS circuit, the signal passes through the AGC amplifier. It is A/C converted internally into a 12-bit signal, and is then input to IC102 of the CA2 circuit board. The gain of the AGC amplifier is controlled by pin (45)-(48) serial signal which is output from IC102 of the CA2 board.

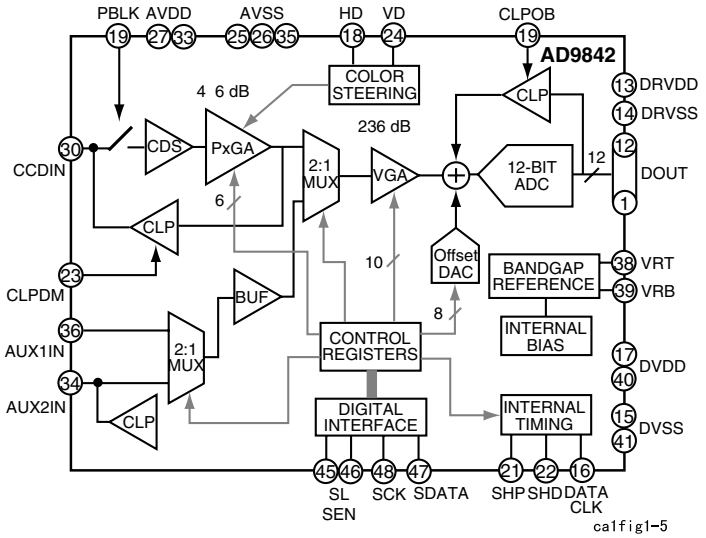


Figure 2-8. IC905 Block Diagram

2.2.1.5 Transfer of Electric Charge by the Horizontal CCD

The transfer system for the horizontal CCD employs a 2-phase drive method.

The electric charges sent to the final stage of the horizontal CCD are transferred to the floating diffusion, as shown in Figure 2-9.

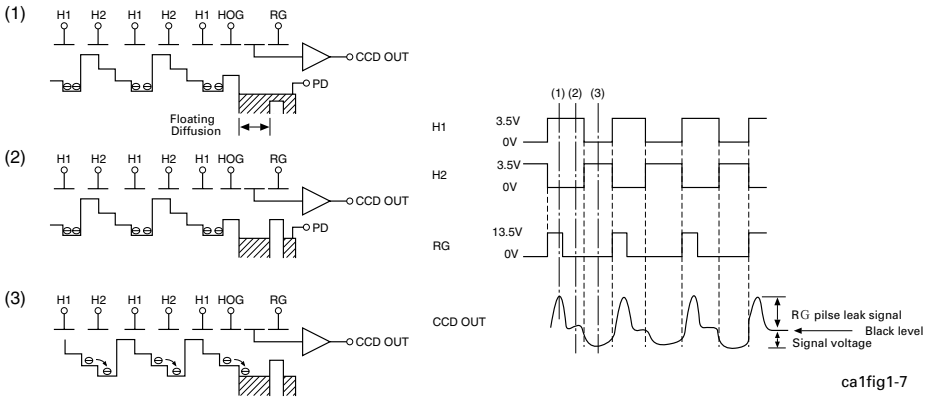


Figure 2-9. Horizontal Transfer of CCD Imager and Extraction of Signal Voltage

RG is turned on by the timing in (1), and the floating diffusion is charged to the potential of PD. The RG is turned off by the timing in (2). In this condition, the floating diffusion is floated at high impedance. The H1 potential becomes shallow by the timing in (3), and the electric charge now moves to the floating diffusion.

Here, the electric charges are converted into voltages at the rate of V = Q/C by the equivalent capacitance C of the floating diffusion. RG is then turned on again by the timing in (1) when the H1 potential becomes deep.

Thus, the potential of the floating diffusion changes in proportion to the quantity of transferred electric charge, and becomes CCD output after being received by the source follower. The equivalent circuit for the output circuit is shown in Figure 2-10.

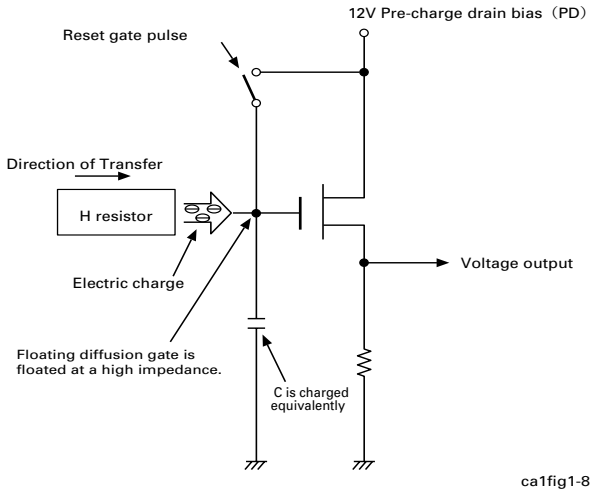


Figure 2-10. Theory of Signal Extraction Operation

2.2.2 CA2 Circuit Description

The figure below is the CA2 Circuit Block Diagram.

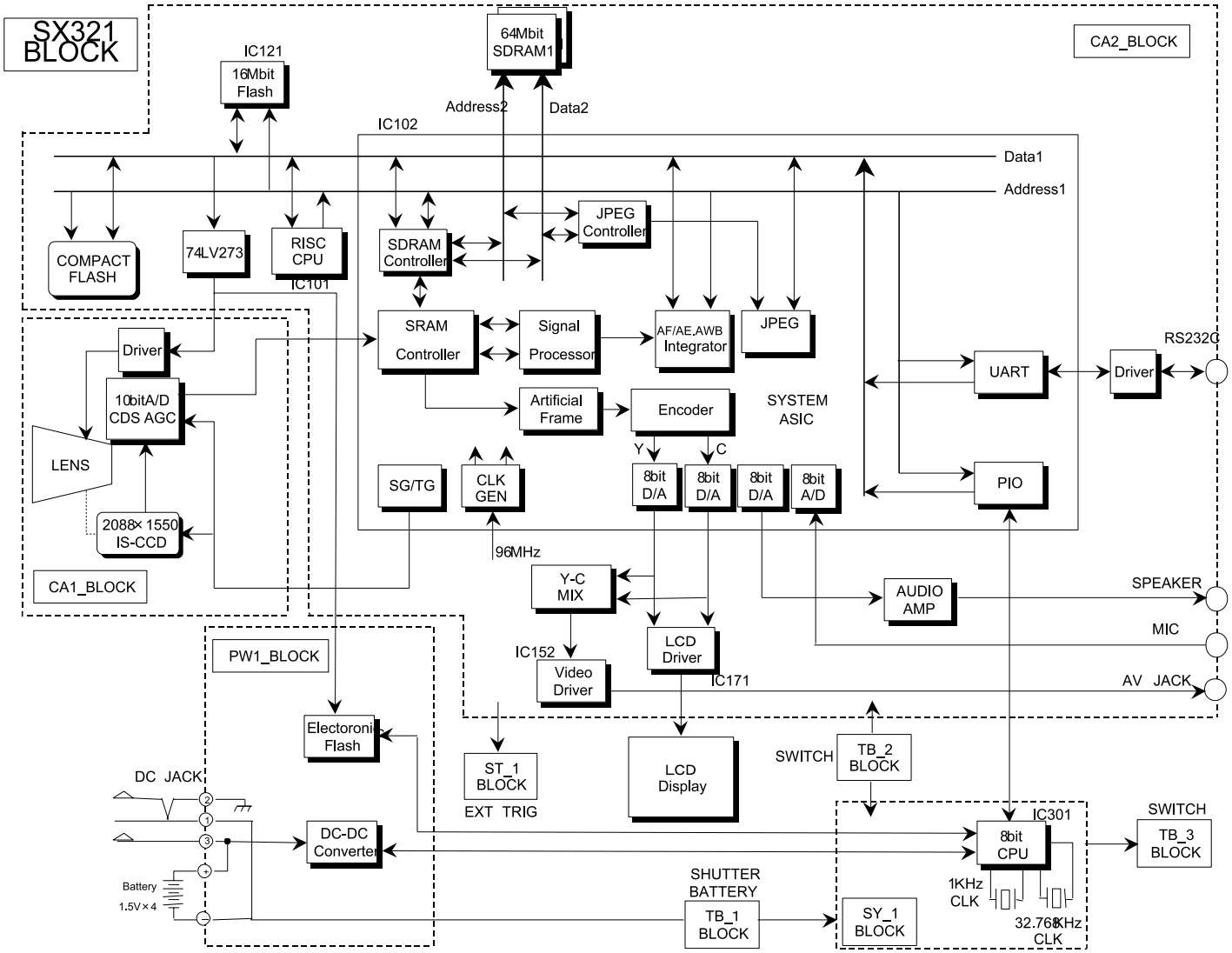


Figure 2-11. CA2 Circuit Block Diagram

2.2.2.1 Circuit Description

DIGITAL CLAMP

Extracting the average value of the optical black section of the CCD from the subsequent data makes the black level of the CCD output data uniform for each line. The optical black section of the CCD averaged value for each line is taken as the sum of the value for the previous line multiplied by the coefficient k and the value for the current line multiplied by the coefficient 1-k.

SIGNAL PROCESSOR

- γ correction circuit
  This circuit performs (gamma) correction in order to maintain a linear relationship between the light input to the camera and the light output from the picture screen.
- Color generation circuit
  This circuit converts the CCD data into RGB signals.
- Matrix circuit
  This circuit generates the Y signals, R-Y signals and B-Y signals from the RGB signals.
- Horizontal and vertical aperture circuit
  This circuit is used generate the aperture signal.
- AE/AWB and AF computing circuit
  The AE/AWB carries out computation based on a 64-segment screen, and the AF carries out computations based on a 6-segment screen.
- SDRAM controller
  This circuit outputs address, RAS, CAS and AS data for controlling the SDRAM. It also refreshes the SDRAM.
- Communication control
  - USART
    The RS-232C can be sued for both synchronous and asynchronous transmission.
  - SIO
    This is the interface for the 4-bit microprocessor.
  - PIO/PWM/SIO for LCD
    8-bit parallel input and output makes it possible to switch between individual input/output and PWM input/output.
  - TG/SG
    Timing generated for 3 million pixel CCD control.
  - Digital encoder
    It generates chroma signal from color difference signal.
  - JPEG control
    Controls the interface for the externally-connected JPEG IC.

2.2.2.2 Outline of Operation

When the shutter opens, the reset signals (ASIC (IC102) and CPU (IC101)) and the serial signals ("take a picture" commands) from the 4-bit microprocessor are input and operation starts. When the TG/SG drives the CCD, picture data passes through the A/D and CDS, and is then input to the ASIC as 10-bit data. The AF, AE, AWB, shutter, and AGC value are computed from this data, and three exposures are made to obtain the optimum picture. The data which has already been stored in the SDRAM is read by the CPU and color generation is carried out. Each pixel is interpolated from the surrounding data as being either Ye, Cy, Mg. or B primary color data to produce R, G and B data. At this time, correction of the lens distortion which is a characteristic of wide-angle lenses is carried out. After AWB and γ processing are carried out, a matrix is generated Y, R-Y and B-Y, and aperture correction is carried out for the Y signal, and the data is then compressed by JPEG and is then written to card memory (compact flash).

When the data is to be output to an external device, it is taken data from the memory and output via the UART. When played back on the LCD and monitor, data is transferred from memory to the SDRAM, and the image is then elongated so that it is displayed over the SDRAM display area.

2.2.2.3 LCD Block

During monitoring, YUV conversion is carried out for the 10-bit CCD data which is input from the A/D conversion block to the ASIC and is then transferred to the DRAM so that the CCD data can be displayed on the LCD.

The data which has accumulated in the DRAM is passed through the NTSC encoder, and after D/A conversion is carried out to change the data into a Y/C signal, the data is sent to the LCD panel and displayed.

If the shutter button is pressed in this condition, the 10-bit data which is output from the A/D conversion block of the CCD is sent to the DRAM (DMA transfer), and after processor, it is displayed on the LCD as a freeze-frame image.

During playback, the JPEG image data which has accumulated in the flash memory is converted to YUV signals, and then in the same way as during monitoring, it is passed through the NTSC encoder, and after D/A conversion is carried out to change the data into a Y/C signal, the data is sent to the LCD panel and displayed.

The two analog signal (Y/C signals) from the ASIC are converted into RGB signals by the LCD driver inside panel, and these RGB signals and the LCD driver inside the panel are used to drive the LCD panel. The RGB signals are 1H transposed so that no DC component is present in the LCD element, and the two horizontal shift register clocks drive the horizontal shift registers inside the LCD panel so that the 1H transposed RGB signals are applied to the LCD panel. Because the LCD closes more as the difference in potential between the COM (common polar voltage: fixed at DC) and the R, G and B signals becomes greater, the display becomes darker; if the difference in potential is smaller, the element opens and the LCD become brighter.

2.2.2.4 Lens Drive Block

The figure below is the lens drive block diagram.

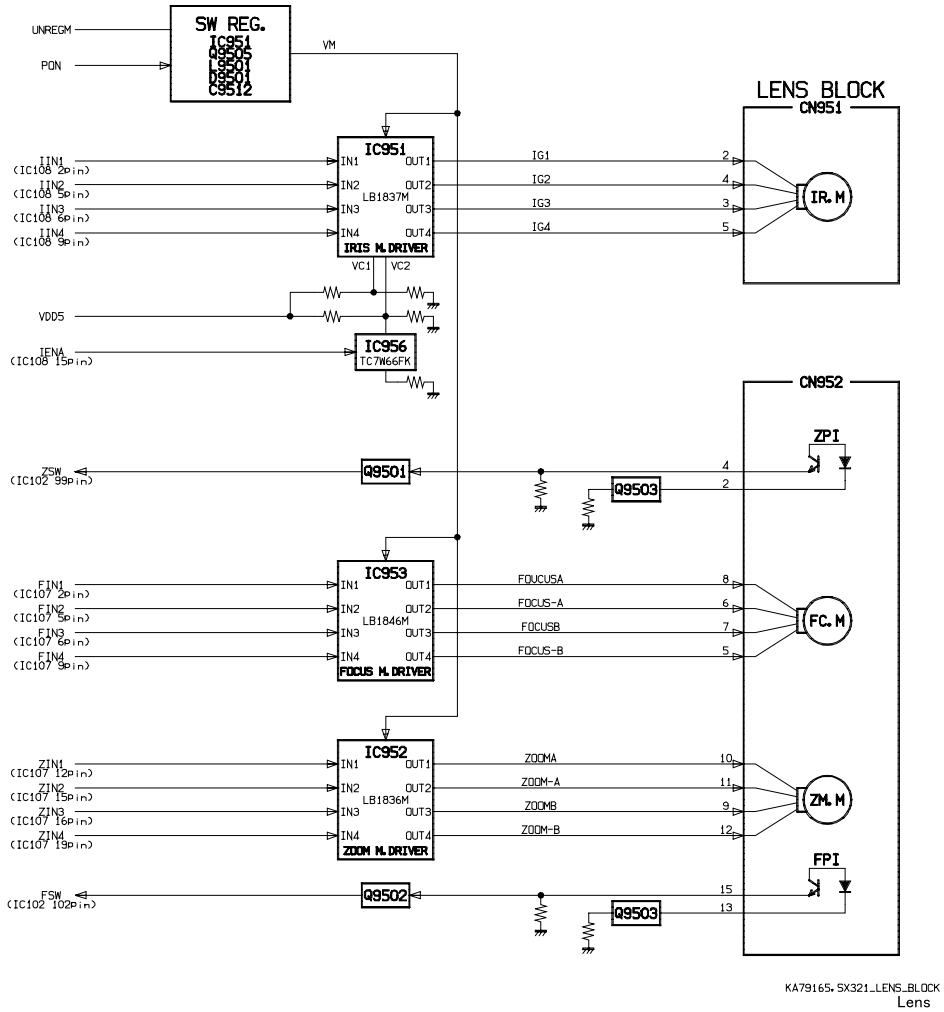


Figure 2-12. Lens Drive Circuit Block Diagram

IRIS AND SHUTTER DRIVE

The iris stepping motor drive signals (IIN1, IIN2, IIN3 and IIN4) which are output from the ASIC expansion port (IC108) are used to drive by the motor driver (IC951), and are then used to drive the iris steps. It can be increased iris steps by IENA control.

FOCUS DRIVE

The focus stepping motor drive signals (FIN1, FIN2, FIN3 and FIN4) which are output from the ASIC expansion port (IC107) are used to drive by the motor driver (IC952). Detection of the standard focusing positions is carried out by means of the photo interrupter (PI) inside the lens block.

ZOOM DRIVE

The zoom stepping motor drive signals (ZIN1, ZIN2, ZIN3 and ZIN4) which are output from the ASIC expansion port (IC107) are used to drive by the motor driver (IC953). Detection of the standard zoom positions is carried out by means of photo reflector (ZPI) inside the lens block.

2.2.3 PW1 Circuit Description

2.2.3.1 Circuit Description

OVERVIEW

The power circuit is mainly composed of the following blocks.

- ☐ Switching controller (IC501)
- ☐ Digital 5 V and analog system power output (T5001, Q5001)
- ☐ Digital 2.5 V system power supply (Q5007)
- ☐ Digital 3.35 V system power supply (Q5018)
- ☐ LCD system power supply (Q5008, T5002)
- ☐ Backlight power supply output (Q5013, T5003)

The figure below is the PW1 electric circuit block diagram.

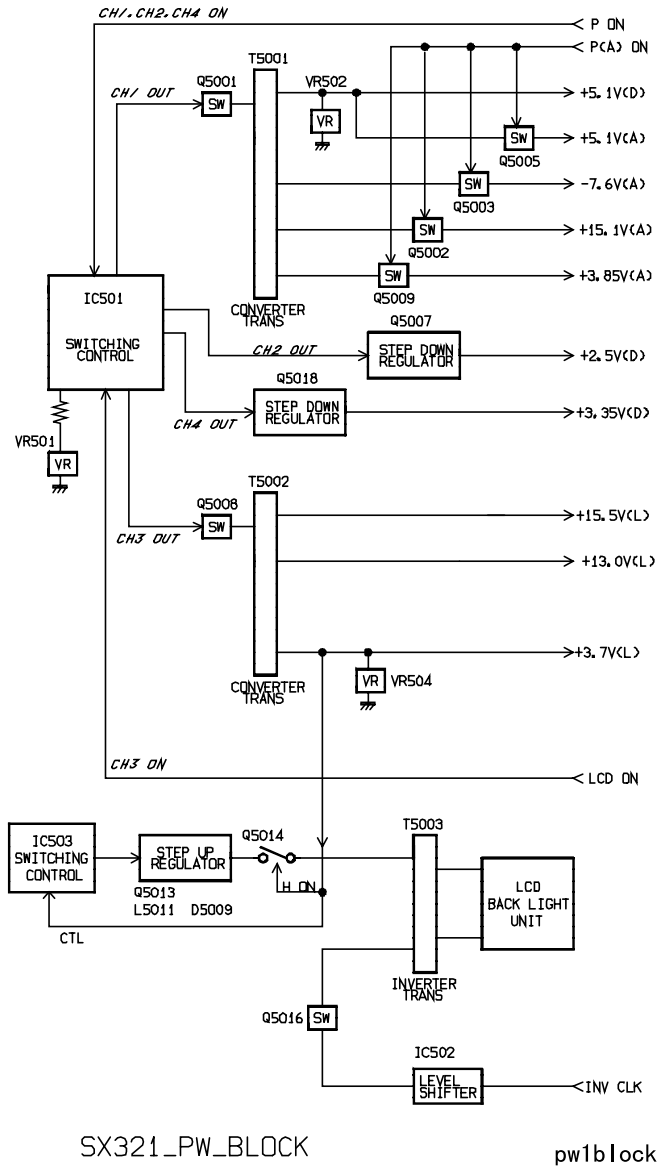


Figure 2-13. PW1 Circuit Block Diagram

SWITCHING CONTROLLER (IC501)

This is the basic circuit which is necessary for controlling the power supply for a PWM-type switching regulator, and is provided with four built-in channels, only CH1 (digital 5 V, analog system), CH3 (LCD system), CH2 (digital 2.5 V) and CH4 (digital 3.35) are used. Feedback from 5 V (D) (CH1), 2.5 V (D) (CH2), 3.7 V (L) (CH3) and 3.35 V (D) (CH4) power supply outputs are received, and the PWM duty is varied so that each one is maintained at the correct voltage setting level.

- ☐ Short-circuit protection circuit
  If output is short-circuited for the length of time determined by the condenser which is connected to Pin (17) of IC501, all output is turned off. The control signal (P ON, P(A) ON and LCD ON) are recontrolled to restore output.

DIGITAL 5 V AND ANALOG SYSTEM POWER OUTPUT

5.1 V (D), 15.1 V (A), -7.6 V (A) and 5.1 V (A) are output. Feedback for the 5.1 V (D) is provided to the switching controller (Pins (29) of IC501) so that PWM control can be carried out.

DIGITAL 2.5 V SYSTEM POWER OUTPUT

2.5 V (D) is output. Feedback is provided to the switching controller (Pin (26) of IC501) so that PWM control can be carried out.

LCD SYSTEM POWER OUTPUT

3.7 V (L), 13.0 V (L) and 15.5 V (L) are output. Feedback for the 3.7 V (L) is provided to the switching controller (Pin (11) of IC501) so that PWM control can be carried out.

DIGITAL 3.35 V POWER OUTPUT

3.35 V (D) is output. Feedback is sent to pins (7) of the switching controller (IC501) for PWM control to be carried out.

SWITCHING CONTROLLER (IC503)

This is the basic circuit which is necessary for controlling the power supply for a PWM-type switching regulator, and is provided with one built-in channel, the control of backlight power supply output to be carried out. Feedback from 7 V (L) power supply outputs are received, and the PWM duty is varied so that each one is maintained at the correct voltage setting level.

BACKLIGHT POWER SUPPLY OUTPUT

7 V (L) is output. Feedback is sent to pins (1) of the switching controller (IC503) for PWM control to be carried out.

INVERTER CONTROL

The backlight uses a 1.8-inch flat picture tube, and is illuminated by controlling T5003 with pulses which are driven by the inverter clock.

2.2.3.2 Strobe CIrcuit Description

The figure below is the strobe circuit block diagram.

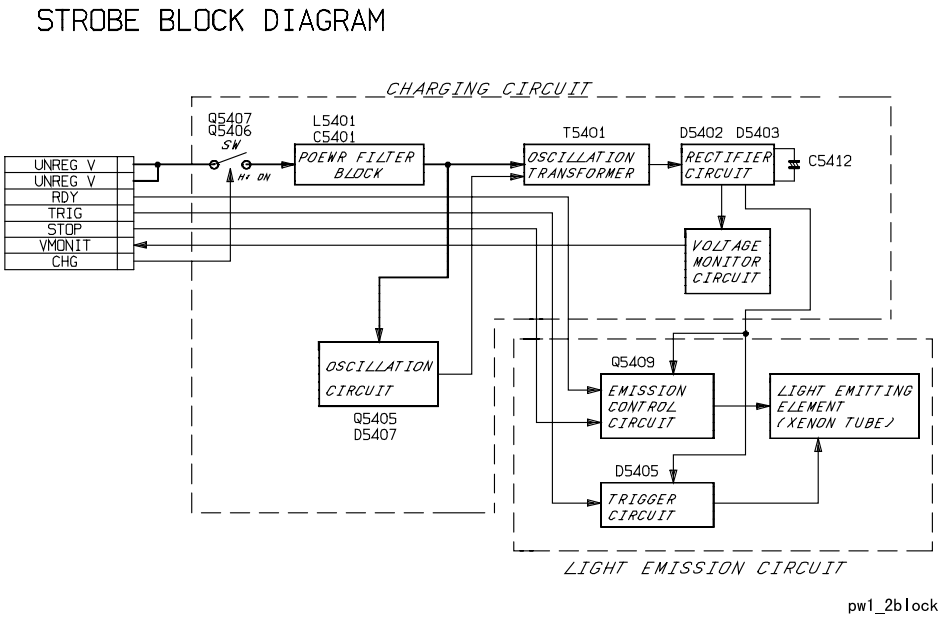


Figure 2-14. Strobe Circuit Block Diagram

CHARGING CIRCUIT

When UNREG power is supplied to the charge circuit and the CHG signal becomes High (3.3 V), the charging circuit starts operating and the main electrolytic capacitor is charged with high-voltage direct current. However, when the CHG signal is Low (0 V), the charging circuit does not operate.

POWER SWITCH

When the CHG signal switches to Hi, Q5406 turns ON and the charging circuit starts operating.

POWER SUPPLY FILTER

L5401 and C5401 constitute the power supply filter. They smooth out ripples in the current which accompany the switching of the oscillation transformer.

OSCILLATION CIRCUIT

This circuit generates an AC voltage (pulse) in order to increase the UNREG power supply voltage when drops in current occur. This circuit generates a drive pulse with a frequency of approximately 50-100 kHz. Because self-excited light omission is used, the oscillation frequency changes according to the drive conditions.

OSCILLATION TRANSFORMER

The low-voltage alternating current which is generated by the oscillation control circuit is converted to a high-voltage alternating current by the oscillation transformer.

RECTIFIER CIRCUIT

The high-voltage alternating current which is generated at the secondary side of T5401 is rectified to produce a high-voltage direct current and is accumulated at electrolytic capacitor C5412 on the main circuit board.

VOLTAGE MONITORING CIRCUIT

This circuit is used to maintain the voltage accumulated at C5412 at a constance level.
After the charging voltage is divided and converted to a lower voltage by R5417 and R5419, it is output to the SY1 circuit board as the monitoring voltage VMONIT. When this VMONIT voltage reaches a specified level at the SY1 circuit board, the CHG signal is switched to Low and charging is interrupted.

LIGHT EMISSION CIRCUIT

When RDY and TRIG signals are input from the ASIC expansion port, the stroboscope emits light.

EMISSION CONTROL CIRCUIT

When the RDY signal is input to the emission control circuit, Q5409 switches on and preparation is made to let current flow to the light emitting element. Moreover, when a STOP signal is input, the stroboscope stops emitting light.

TRIGGER CIRCUIT

When a TRIG signal is input to the trigger circuit, D5405 switches on, a high-voltage pulse of several kilo volts is generated inside the trigger circuit, and this pulse is then applied to the light emitting part.

LIGHT EMITTING ELEMENT

When the high-voltage pulse form the trigger circuit is applied to the light emitting part, current flows to the light emitting element and light is emitted.

Beware of electric shocks.
Special attention is needed because high voltage is generated around C5412 and xenon lamp terminals.

2.2.4 SY 1 Circuit Description

2.2.4.1 Configuration and Functions

For the overall configuration of the SY1 circuit board, refer to the block diagram below.

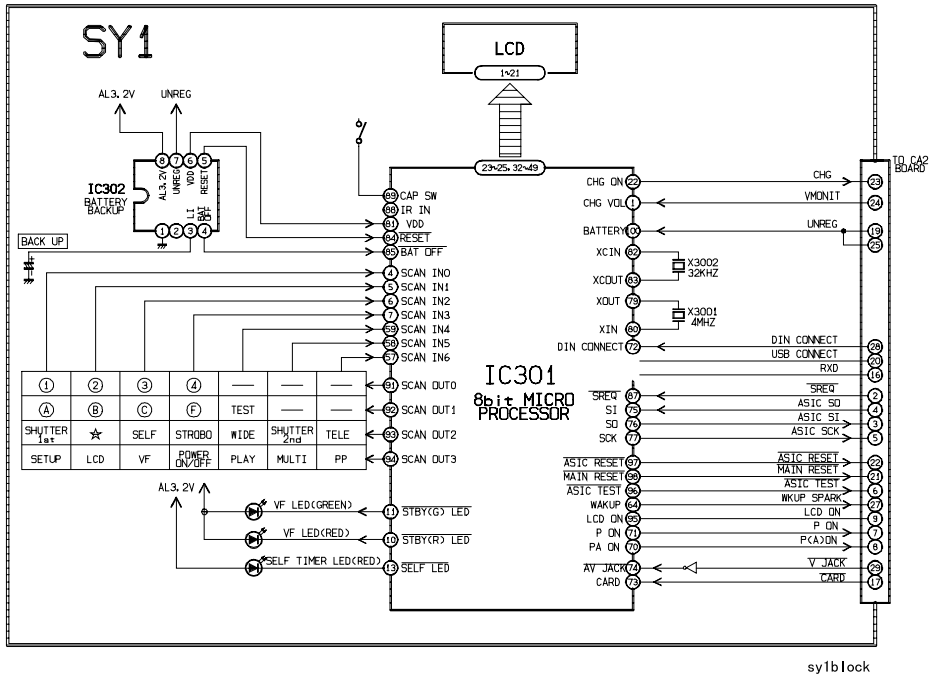


Figure 2-15. SY1 Circuit Board Block Diagram

The configuration of the SY1 circuit board centers around a 8-bit microprocessor (IC301). The 8-bit microprocessor handles the following functions:1. Operation key input, 2. Mode LCD display, 3. Clock control, 4. Power ON/OFF, 5. Strobe charge control.

Table 2-3. 8bit Micro Processor Pin Configuration

Pin	Signal	I/O	Outline
1	CHG VOL	I	Strobe charge voltage input (analog input)
2-3	NOT USED	-	--
4-7	SCAN IN 0-3	I	Key matrix input
8	AVDD	-	A/D converter analog power terminal
9	AVREF	I	A/D converter standard voltage input terminal
10	$\overline{\text{STBY (R) LED}}$	O	Standby LED (red) ON/OFF signal L: LED light
11	$\overline{\text{STBY (G) LED}}$	O	Standby LED (green) ON/OFF signal L: LED light
12	VSS	-	GND
13	$\overline{\text{SELF LED}}$	O	Self-timer LED ON/OFF signal L: LED light
14-19	NOT USED	-	--
20	$\overline{\text{AVREF ON}}$	O	A/D standard voltage ON/OFF signal L: ON
21	NOT USED	-	--
22	CHG ON	O	Flash charge ON/ OFF signal H: ON
23-25	COM1-3	O	Model LCD common signal output
26	NOT USED	-	--
27	BIAS	-	LCD motor voltage supply terminal
28-30	VLC0-2	-	LCD motor voltage terminal
31	VSS	-	GND
32-49	S1-18	O	Model LCD segment signal output
50-56	NOT USED	-	--
57-59	SCAN IN 4-6	I	Key matrix input
60-63	NOT USED	-	--
64	WAKE UP	O	Wake up output signal
65-69	NOT USED	-	--
70	PA ON	O	DC/DC converter (analog) ON/ OFF signal H: ON

Table 2-3. 8bit Micro Processor Pin Configuration

Pin	Signal	I/O	Outline
71	P ON	O	DC/DC converter ON/ OFF signal H: ON
72	DIN CONNECT	I	DIN jack connect detection signal H: Connection
73	$\overline{\text{CARD}}$	I	Extension memory card attachment detection signal L: Attachment
74	AV JACK	I	Video output cable connection detection signal H: Connection
75	SI	I	Serial communication data input (←ASIC)
76	SO	O	Serial communication data output (→ASIC)
77	SCK	O	Serial communication clock output (→ASIC)
78	IC	-	Connect to VSS
79	XOUT	O	Main clock oscillation terminal (4 MHz)
80	XIN	I	Main clock oscillation terminal
81	VDD	-	Power supply terminal
82	XCIN	I	Sub clock oscillation terminal (32.768 kHz)
83	XCOUT	O	Sub clock oscillation terminal
84	RESET	I	Reset input
85	$\overline{\text{BAT OFF}}$	I	Battery OFF detection signal L: OFF
86	RXD	I	RS-232C RXD input terminal
87	$\overline{\text{SREQ}}$	I	Serial communication request signal L: Request
88	$\overline{\text{USB}}$	I	USB connector connection detection signal L: connection
89	CAP SW	I	Lens cap switch L: Attachment
90	NOT USED	-	--
91-94	SCAN OUT 0-3	O	Key matrix output
95	LCD ON	O	LCD monitor power ON/ OFF signal H: ON
96	ASIC TEST	O	ASIC reset control signal

Table 2-3. 8bit Micro Processor Pin Configuration

Pin	Signal	I/O	Outline
97	$\overline{\text{ASIC RESET}}$	O	ASIC reset signal L: Reset output
98	$\overline{\text{MAIN RESET}}$	O	SPARC reset signal L: Reset output
99	AVSS	-	A/D converter GND power terminal
100	BATTERY	I	Battery voltage input (analog input)

2.2.4.2 Internal Communication Bus

The SY1 circuit board carries out overall control of camera operation by detecting the input from the keyboard and the condition of the camera circuits. The 8-bit microprocessor reads the signals from each sensor element as input data and outputs this data to the camera circuits (ASIC) or to the LCD display device as operation mode setting data. Figure 2-16 shows the internal communication between the 8-bit microprocessor, ASIC and SPARC lite circuits.

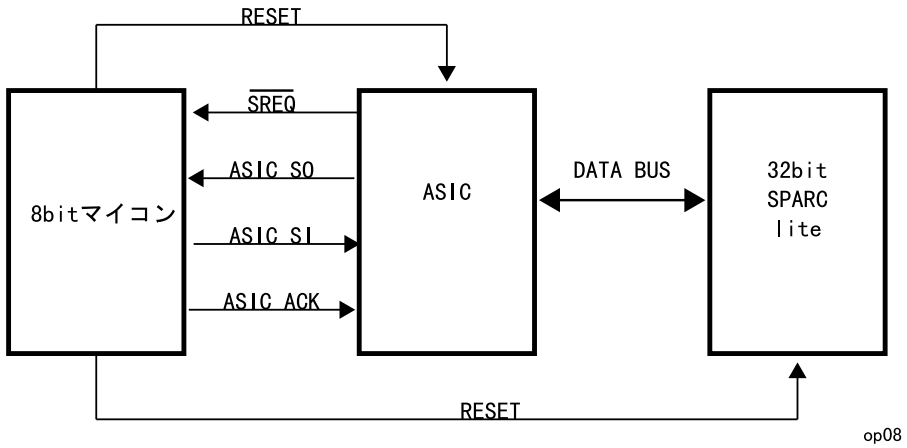


Figure 2-16. Internal Bus Communication System

2.2.4.3 Power Supply Control

The 8-bit microprocessor controls the power supply for the overall system.

The following is a description of how the power supply is turned on and off. When the battery is attached, a regulated 3.2 V is normally input to the 8-bit microprocessor (IC301) by IC302, so that clock counting and key scanning is carried out even when the power switch is turned off, so that the camera can start up again. When the battery is removed, the 8-bit microprocessor operates in sleep mode using the backup capacitor. At this time, the 8-bit microprocessor only carries out clock counting, and waits in standby for the battery to be attached again. When a switch is operated, the 4-bit microprocessor supplies power to the system as required.

The 8-bit microprocessor first sets both the P ON signal at pin (71) and the PA ON signal at pin (70) to high, and then turns on the DC/DC converter. After this, High signals are output from pins (97) and (88) so that the ASIC and the SPARC lite are set to the active condition. If the LCD monitor is on, the LCD ON signal at pin (95) set to high, and the DC/DC converter for the LCD monitor is turned on. Once SPARC lite processing is completed, the ASIC and the SPARC lite return to the reset condition, all DC/DC converters are turned off and the power supply to the whole system is halted.

Table 2-4. Camera Mode (Battery Operation)

		SPARC Lite	ASIC memory	RS232C Driver	CCD	8bit CPU	MODE LCD	LCD MONITOR
Supply voltage		3.3V	3.3V	5V	5V(A), +15V, -9V	3.2V (ALWAYS)	3.2V (ALWAYS)	5V(L) +12V etc.
Power OFF		OFF	OFF	OFF	OFF	32KHz	ON	ON
Power ON	Play back	ON	ON	ON	OFF	4MHz	ON	ON
	Power SW On-Auto power down	OFF	OFF	OFF	OFF	4MHz	ON	OFF
	Shutter SW ON	ON	ON	ON	ON→OFF	4MHz	ON	OFF
	Resolution, Flash, Self timer SW ON	OFF	OFF	OFF	OFF	4MHz	ON	OFF
	LCD finder	ON	ON	ON	ON	4MHz	ON	ON

Table 2-5. Host Mode (Battery Operation)

		SPARC Lite	ASIC memory	RS232C Driver	CCD	8bit CPU	MODE LCD	LCD MONITOR
Supply voltage		3.3V	3.3V	5V	5V(A),+15V,-9V	3.2V(ALWAYS)	3.2V(ALWAYS)	5V(L)+12V etc.
Power OFF		OFF	OFF	OFF	OFF	32KHz	OFF	OFF
Power ON	Power SW On-AUTO power down	OFF	OFF	OFF	OFF	4MHz	ON	OFF
	Take a picture	ON	ON	ON	ON→OFF	4MHz	ON	OFF
	Erase image	ON	ON	ON	OFF	4MHz	ON	OFF
	Download image	ON	ON	ON	OFF	4MHz	ON	OFF
	Continuous image	ON	ON	ON	ON	4MHz	ON	OFF
	Massage from host	ON	ON	ON	ON	4MHz	ON	OFF

NOTE: *P.SAVE=Power save mode, 4MHz=Main clock operation, 32KHz=Sub clock operation.*

CHAPTER

3

TROUBLESHOOTING

3.1 Overview

PhotoPC 3000Z does not have error indication such as LCD and LED. Perform the following repairing method according to the symptoms. Even when the symptoms look the same, there are various reasons for the trouble. Check the troubleshooting points described in this chapter and perform the best repairing method.

- **Before disassembling the camera, remove the battery and plug off the AC adapter.**
- **The electrolytic capacitor (C5412) mounted on PW1 board is for flash strobe and set to be charged automatically whenever the power is ON. Due to this, it may cause electric shock during the service procedure. When repairing, be sure to discharge the camera, using the cement resistance. (See Ch4 for details.)**

3.1.1 LED Indication on Various Conditions

PhotoPC 3000Z always supervises the condition of its components and indicates the condition by VF side lamp (red/ green LED). (See "LED Indication on Various Conditions" on page 54.)

Table 3-1. LED Indication on Various Conditions

Conditions	VF side lamp (red/green LED)	VF side lamp (red/green LED)	Note
Ready to take picture		ON	
Focusing		Blink (0.2 sec. interval)	
Focus lock		ON	
CF writing	Blink (0.5 sec. interval)		
Battery warning	Blink (1 sec. interval)		With control panel indication
Error	ON		
Self timer ON		ON	• Front side red LED -First 8 sec: low speed blinking (0.5 sec. interval) -Last 2 sec: high speed blinking (0.2 sec. interval) • With control panel indication
Video mode		Blink (0.1 sec. interval)	
Applying the power (standby)		Blink (0.2 sec. interval)	
Lens cap on		Blink (0.2 sec. interval)	
CF is not installed		Blink (0.2 sec. interval)	

3.2 Troubleshooting

This section describes how to check the defective unit and parts according to its symptoms.

After installing the battery or installing the AC adapter, if LCD is not indicated or if the red LED continues blinking and does not move on to the standby condition, see the following tables that give you checking points and solutions.

- **If any errors occurred on the 8 bit micro computer on SY1 board, which controls the user interface, it cannot output commands to generate the various digital and analog power and the camera becomes "power cannot be applied" condition.**
- **8-bit micro computer performs serial communication with CPU on CA2 board. Same error will be generated if any errors occurred on CA2 board.**

Table 3-2. Cannot Apply Power.

Step	Check Item	Y/N	Solution
1	Check the pulse input of 91 pin (SCAN IN 0) of IC301.	No	Check the harness and CN301, R3021 including power SW.
2	Check the pulse input of 7 pin (UP UNREG) of IC302.	Low	Check PW1, CA2.
3	Check the pulse input of 81 pin (VDD) of IC301.	Low	Check IC302.
4	Check the pulse input of 84 pin ($\overline{\text{RESET}}$) of IC301.	Low	Check IC302 and R3051.
5	Check the pulse input of 85 pin ($\overline{\text{BAT OFF}}$) of IC301.	Low	Check R3052.
6	Check the oscillation of 80 pin (XIN) of IC301.	No	Check X3001.
7	Check the pulse input of 82 pin (XCIN) of IC301.	No	Check IC302, R3004, C3001 and C3002.
8	Check IC301.	--	--

Table 3-3. Cannot Shoot a Picture.

Step	Check Item	Y/N	Solution
1	Press the shutter button.	--	--
2	Check pulse input of 3 or 7 pin (SCAN IN3) of IC301.	No	Check the shutter switch, CN301, R2023 and R3024.
3	Check pulse input of 7 or 8 pin (PON, P(A) ON) of IC301.	Low	Check IC301, Q3005, Q3006 and PW1.
4	Check if 6, 12 or 13 pin of IC301 all HIGH?	No	Check IC301, PW1 and CA2.
5	Is serial communication normal?	NG	Check IC301 and CA2.
6	Check CA2.	--	--

Table 3-4. Cannot Take in Pictures

Step	Check Item	Y/N	Solution
1	Is the system drive clock (72MHz) input to the 280 pin (CLK IN1) of IC102?	Yes	Check X1101 and IC111.
2	Is CLK (36MHz) input to the 132 pin (CLK IN) of IC101?	No	Check 278 pin of IC102.
3	Check 61 pin (ZAS) of IC101.	NG	This signal always appears when CPU accesses to the memories. CPU may not read program from IC121. Check address / data bus with IC121.
4	Check 52 pin (ZBREQ) of IC101.	NG	Request for use o data bus form ASIC to CPU. No DMA transmission if this signal is absent.

Table 3-4. Cannot Take in Pictures

Step	Check Item	Y/N	Solution
5	Check 56 pin (ZBGRNT) of IC101.	NG	This signal appears when CPU receives ZBREQ and gives permission to ASIC for use of data bus. No DMA transmission if this signal is absent.
6	Check the signal of 118 and 119 pin (IRL1, 2) of IC101.	NG	Hand-shaking between 8 bit micro computer and RS-232C is defective. Check each interface.
7	Check soldering of CPU and memories.	--	--

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 Overview

This chapter describes disassembling and assembling procedure for each components. Usually assembling can be done by the reverse order of the disassembling procedure, but this manual has the assembling section as assembling of PhotoPC 3000Z is complicated.

4.1.1 Caution

Read the following cautions before disassembling and assembling the camera.

- **Remove the batteries and plug off the AC adapter before disassembling the camera.**
- **The electrolytic capacitor (C5412) mounted on PW1 board is for flash strobe and set to be charged automatically whenever the power is ON. Due to this, it may cause electric shock during the service procedure. When repairing, be sure to discharge the camera, using the cement resistance. (See Figure 4-2, "Discharging Electrolytic Capacitor".)**

- **For this product, there are two repair levels; first maintenance and 2nd maintenance. The service for second maintenance is allowed to be done only by the service center equipped with special instruments for adjustment. We do not guarantee the repair result performed by the others.**
- **See Table 4-1 to categorize between the 1st maintenance and the 2nd maintenance.**
- **Use the special package for transportation.**

Table 4-1. 1st / 2nd Level Maintenance

No.	Replacing Parts	Adjustment Items	Category
1	CA1 Board	1. Initial operation 2. AWB adjustment 3. Color matrix adjustment 4. CCD defect detect adjustment 5. LCD panel adjustment 6. Lens adjustment Note: Observe the order except for the lens adjustment.	2nd maintenance
2	CA2 Board	Same as CA1 Board.	2nd maintenance
3	Lens	1. Lens adjustment 2. AWB adjustment 3. Color matrix adjustment 4. CCD defect detect adjustment Note: Observe the order except for the lens adjustment.	2nd maintenance
4	CCD	Same as lens adjustment.	2nd maintenance
5	LCD	LCD panel adjustment	1st maintenance
6	SY1 Board	Note: When replacing the terminals on SY1 board, perform the following adjustment. (2nd maintenance) Observe the order except for the lens adjustment. 1. Lens adjustment 2. AWB adjustment 3. Color matrix adjustment 4. CCD defect detect adjustment	1st maintenance

Table 4-1. 1st / 2nd Level Maintenance

No.	Replacing Parts	Adjustment Items	Category
7	PW1 Board	Note: When replacing the terminals on PW1 board, perform the following adjustment. (2nd maintenance) Observe the order except for the lens adjustment. 1. IC501 oscillation frequency adjustment 2. IC502 oscillation frequency adjustment 3. 5.0V (D) voltage adjustment 4. 3.3V (D) A voltage adjustment 5. 3.4V (D) B voltage adjustment 6. 12.4V (L) voltage adjustment 1 7. 12.4V (L) voltage adjustment 2 8. 5.8V (L) voltage adjustment 9. Lens adjustment 10. AWB adjustment 11. Color matrix adjustment 12. CCD defect detect adjustment	1st maintenance

4.1.2 Tools

The following tables explain the tools needed for repairing service.

Table 4-2. Equipment

Name	Note
Oscilloscope	100MHz or more
Digital multi meter	--
Host computer	Win95 or 98 environment Following devices are required. • CD-ROM drive • 3.5 inch FD drive • Standard RS-232C (serial transmission speed: 19200 bps or more) • RAM: 8MB or more • HDD drive: 15 MB or more • VGA or AVGA monitor with at least 256-color display.
Direct current stabilizing power supply	--
Frequency counter	--
AC adapter	--

Table 4-3. Tools

No.	Name		Note
1	Color Viewer 5100 K	X	103058400
2	DscCal V122 (TBD) adjustment program	X	Issued with this manual.
3	Fine driver (+)	○	
4	Siemens star chart	X	Attached on this manual appendix.
5	Color adjustment chart	○	104268100
7	Soldering device	○	B740200100
7	Tweezers	○	B741000100

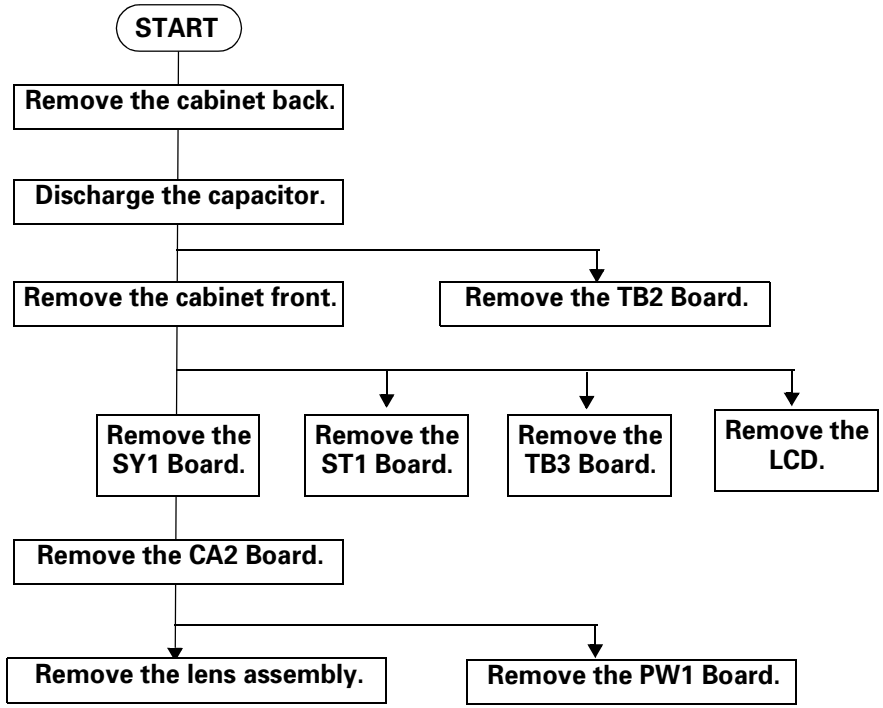
○: available in the market, X: not available in the market.

CAUTION

- **Adjustment can be done by PC/AT compatible machine with 80486 mounted: Not by Mac. PC.**
- **AWB adjustment for PhotoPC 3000Z may take time and host PC time out error may be occurred accordingly. Adjustment program DscCaliDi124 is made to counter this problem. You can also adjust other previous models by this program.**

4.2 Disassembly

The flowchart below shows the disassembling procedure.



Flowchart 4-1. Disassembling Flowchart

4.2.1 Cabinet Back / Front, TB2/3, ST1 Board Removal

This section explains the disassembling of the cabinet (front / back), TB2/3 board and ST1 board. Disassembling procedure should follow numbers indicated in the figure below.

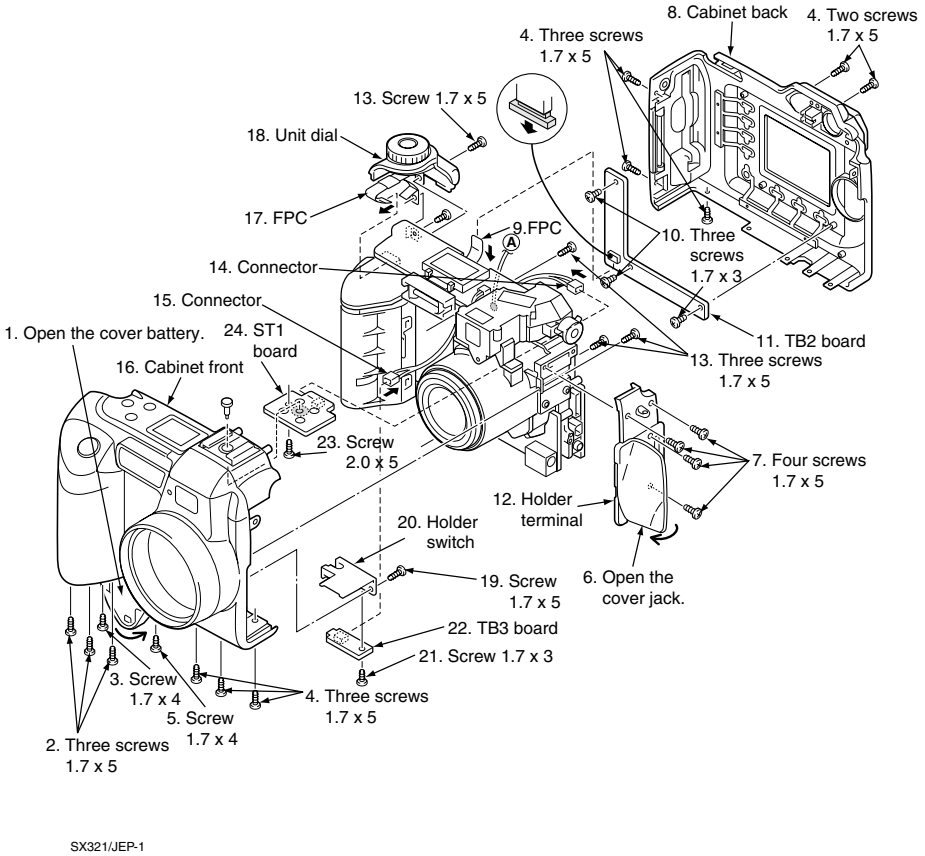

8. Cabinet back
4. Two screws 1.7 x 5
4. Three screws 1.7 x 5
13. Screw 1.7 x 5
18. Unit dial
17. FPC
9.FPC
10. Three screws 1.7 x 3
14. Connector
15. Connector
1. Open the cover battery.
24. ST1 board
16. Cabinet front
11. TB2 board
13. Three screws 1.7 x 5
23. Screw 2.0 x 5
7. Four screws 1.7 x 5
12. Holder terminal
20. Holder switch
19. Screw 1.7 x 5
6. Open the cover jack.
22. TB3 board
21. Screw 1.7 x 3
3. Screw 1.7 x 4
5. Screw 1.7 x 4
4. Three screws 1.7 x 5
2. Three screws 1.7 x 5
SX321/JEP-1

Figure 4-1. Removal of Cabinet Back, Cabinet Front, TB2 Board, TB3 Board and ST1 Board

WARNING

The electrolytic capacitor (C5412) mounted on PW1 board is for flash strobe and set to be charged automatically whenever the power is ON. Due to this, it may cause electric shock during the service procedure. When repairing, be sure to discharge C5412, using the cement resistance. (See Figure 4-2, "Discharging Electrolytic Capacitor".)

4.2.2 Discharging Electrolytic Capacitor

The following is the discharging process of main electrolytic capacitor (C5412) on PW1. If you skip this operation, there is a great possibility of electric shock during the disassembling procedure.

1. Prepare the cement resistance with more than 560Ω/10W.
2. Contact 2 lead wires to the soldering cotton on the both poles of electrolytic capacitor. (No polarity at this stage.)

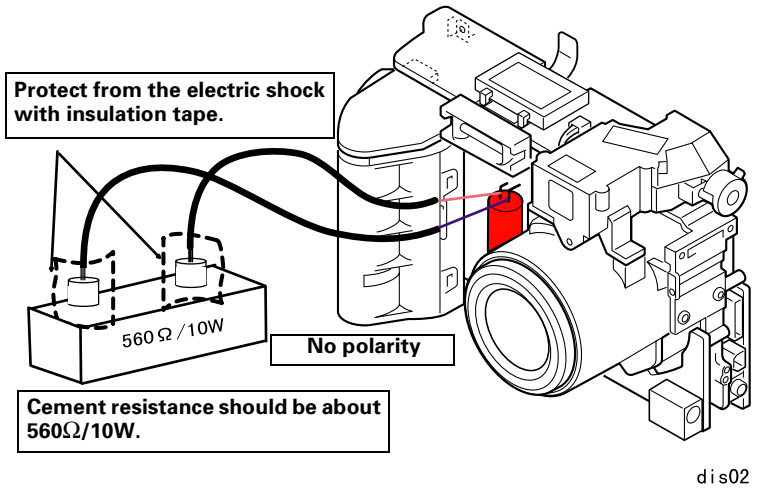


Figure 4-2. Discharging Electrolytic Capacitor

4.2.3 Removal of SY1 and LCD

The following is the discharging process of SY1 and LCD. Disassembling procedure should follow numbers indicated in the figure below.

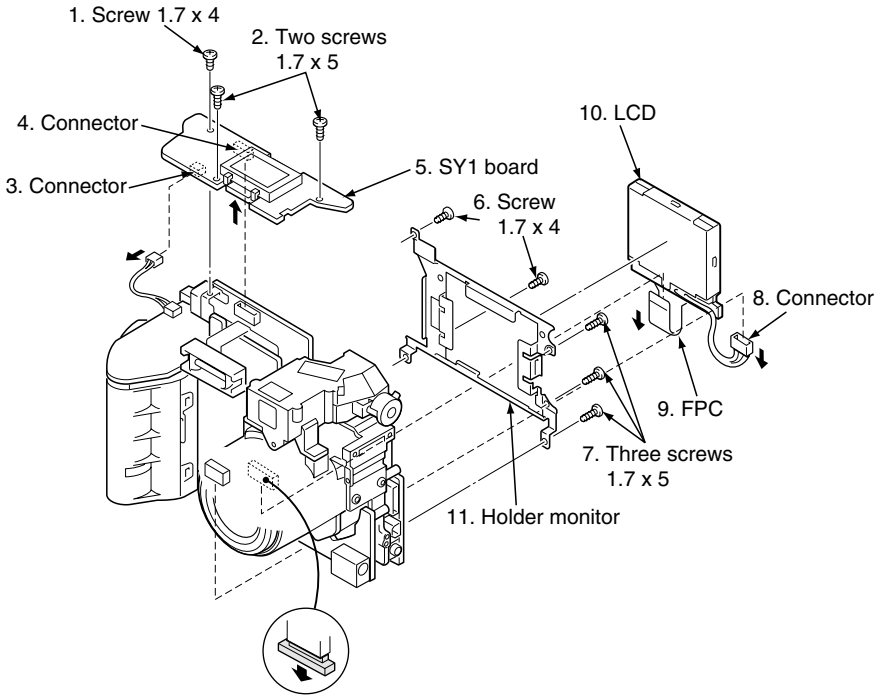


Figure 4-3. Removal of SY1 and LCD

ADJUSTMENT REQUIRED

When replacing the LCD, perform the LCD panel adjustment. (See Ch5.)

4.2.4 Removal of CA1/2 Board and Lens Assembly

The following is the discharging process of CA1 Board, CA2 Board and Lens assembly. Disassembling procedure should follow numbers indicated in the figure below.

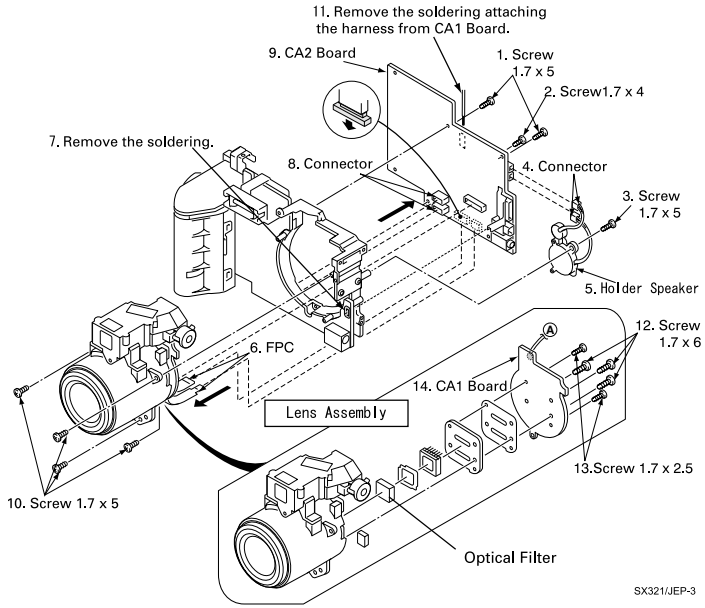


Figure 4-4. Removal of CA1, CA2 and Lens Assembly

ADJUSTMENT REQUIRED

When replacing the CA1 board, CA2 board, or lens assembly, perform the adjustment. (See Ch5.)

CAUTION

Be careful at its direction when installing the optical filter of the lens assembly. (See “Assembly” on page 64.)

4.2.5 Removal of Holder Battery and PW1 Board

The following is the discharging process of holder battery and PW1 board. Disassembling procedure should follow numbers indicated in the figure below.

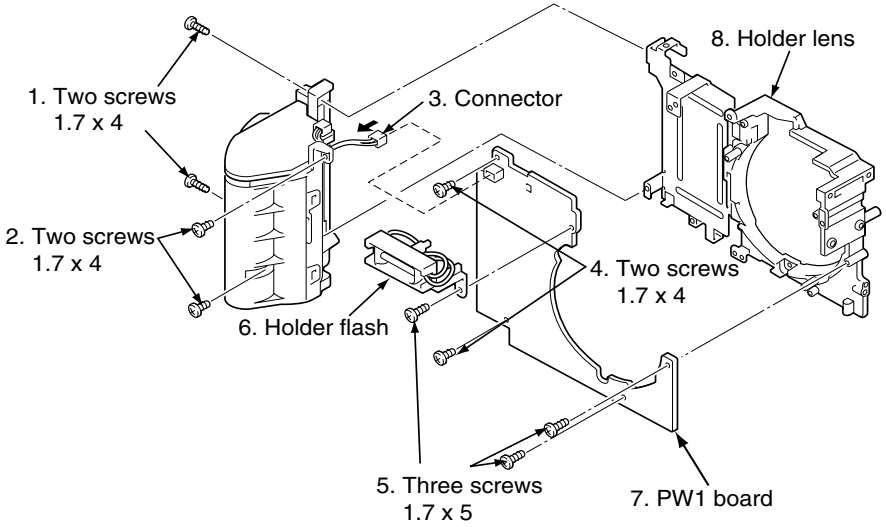


Figure 4-5. Removal of Holder Battery and PW1 Board

ADJUSTMENT REQUIRED

When replacing the PW1 Board, perform adjustment. (See Ch5.)

4.3 Assembly

4.3.1 Assembling the Lens Assembly

1. Check if there is no dust or scratch on the surface of the Optical Filter (2) and install it toe the LENS ASSY (1).

NOTE: *Be careful at the direction when installing the Filter. (See Figure 4-7.)*

2. Insert the SPACER (3).
3. Remove the protective sheet of CCD (4) and check if there is no dust or scratches on the surface and install the CCD, aligning with guide rib of the holder.
4. Install the MOUNTING LENS (5), aligning with guide pin of the holder and secure it with 3 screws (6) (1.7x6).
5. Install the SPACER INSULATOR (7), aligning the guide pin of the holder.
6. Attach the PAD (10) to the Lens.

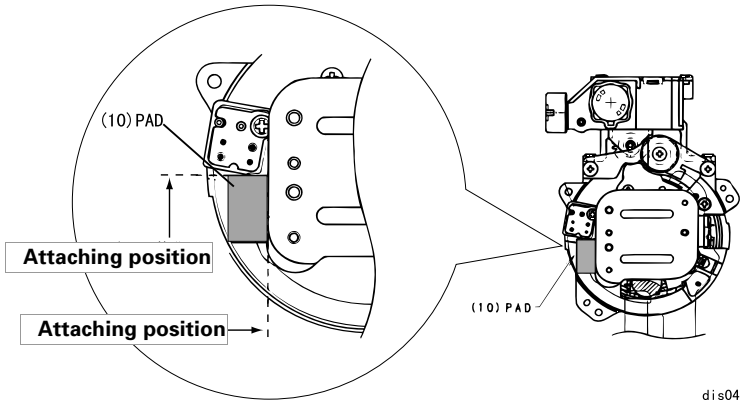


Figure 4-6. Installing the PAD

7. Install the CA1 (8) holder, aligning with the guide pin and the CCD terminal and secure it to the MOUNTING LENS with 2 screws (9) (1.7x2.5).
8. Solder the CCD terminal to the CA1.

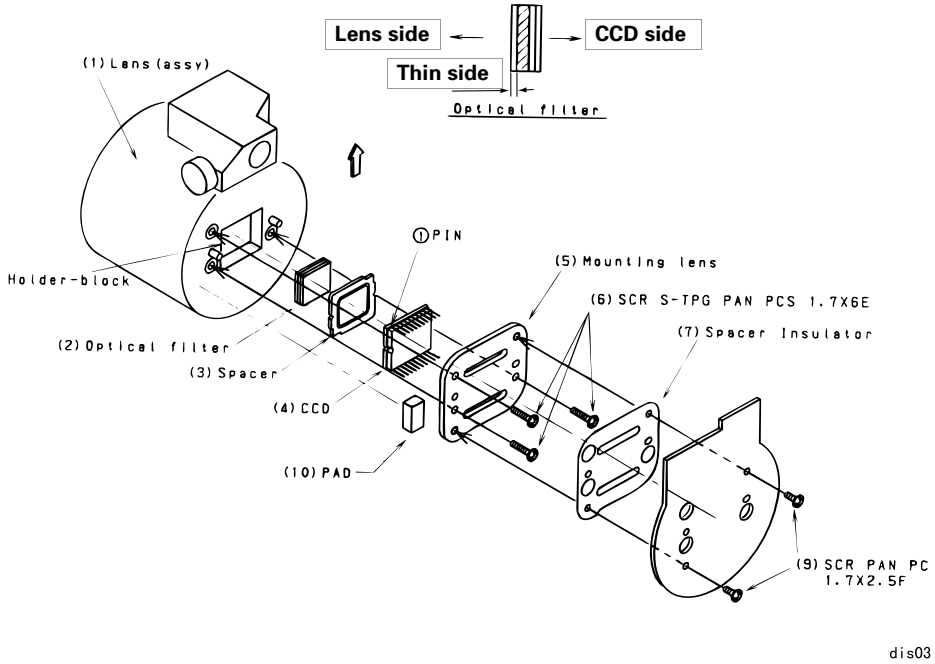


Figure 4-7. Assembling the Lens Assembly

4.3.2 Installing the SY1 Board

1. Insert the connector of ASSY, WIRE (2) to the SY1 board (1).
2. Connect the connector CN303 of SY1 board to the connector CN106 of the CA2 board. Secure it with 2 screws (1.7x5).
3. Connect the harness from the TB1 board to the connector CN301 of the SY1 board.

CHECK POINT

Do the following preparation so that the harnesses would not interfere with the shutter operation.

- **Set the harness from the TB1 board to the same height with connector CN302 of the SY1 board and strain it a little bit.**
- **The core of the harness from the TB1 should be pressed and secured under the super capacitor C3001.**

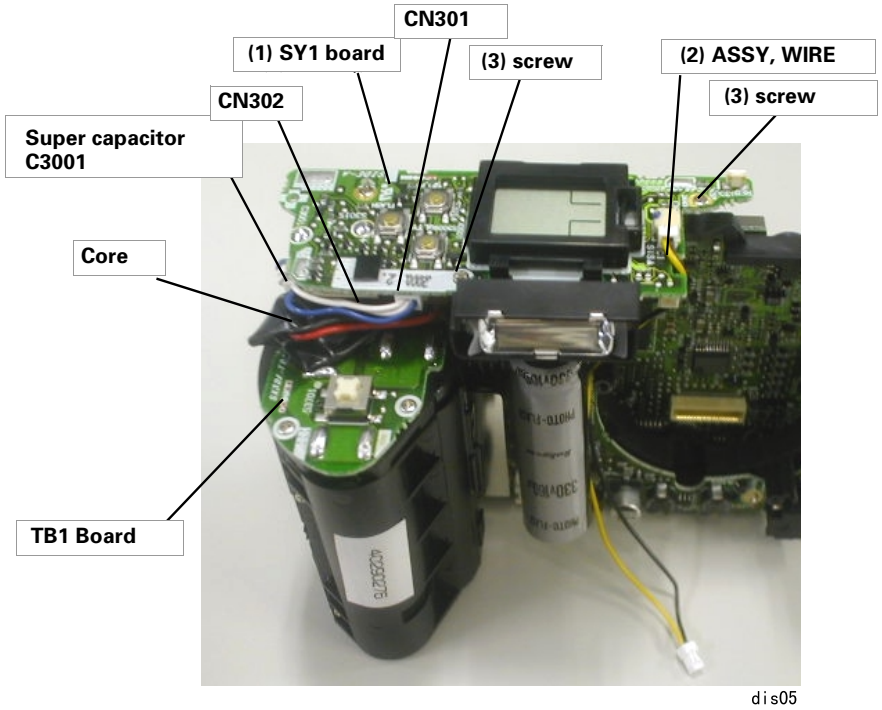


Figure 4-8. Installing the SY1 Board

4.3.3 Installing the CABINET TOP

1. Install the ST1 board (1) to the CABINET TOP and secure it with 1 screw (2) (2.0x5).
2. Connect the pin to ST1 board.

CHECK POINT

- **Hold the pin when soldering the pin so that the pin does not get off. (See Figure 4-9.)**
- **When soldering the pin, be sure that the soldering part is shorter than the length of pin. (See Figure 4-9.)**

3. Secure the CABINET TOP to the CABINET FRONT with 3 screws (3) (1.7x5).

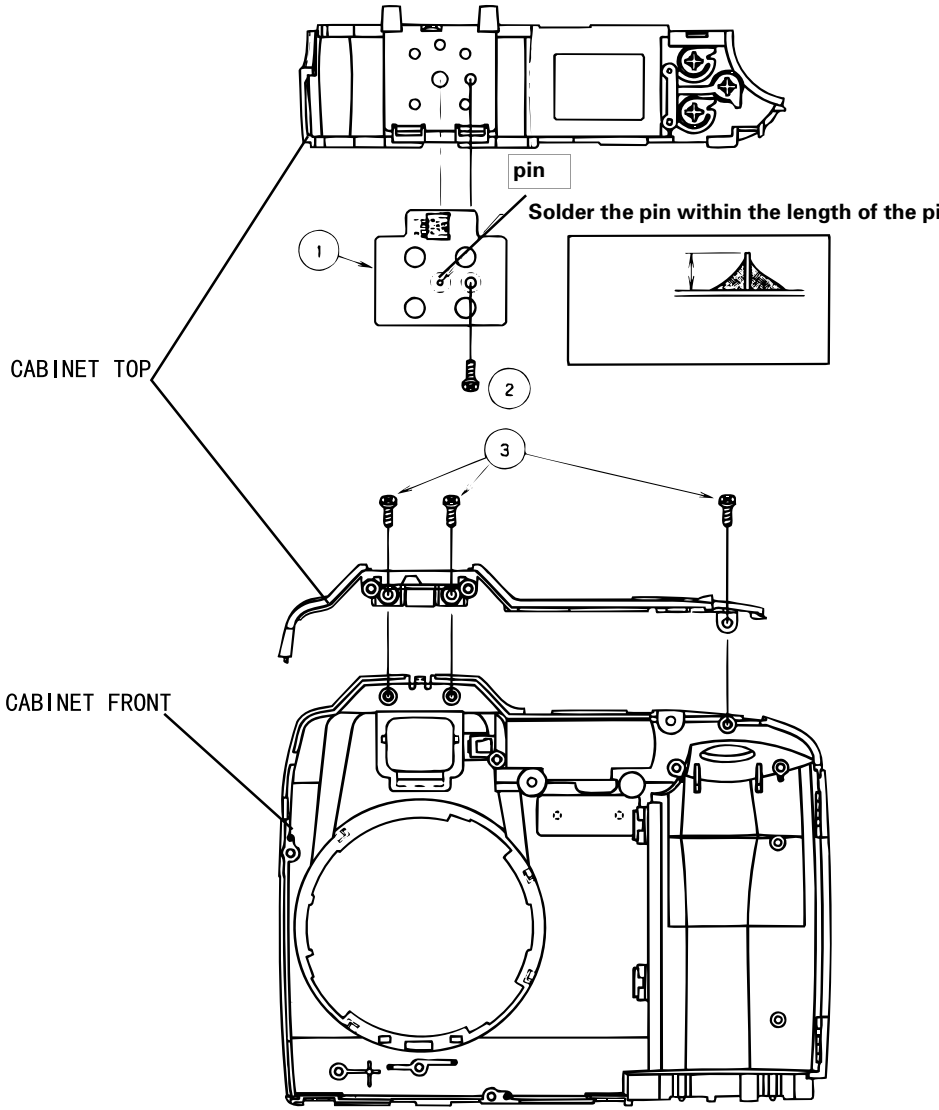


Figure 4-9. Installing the CABINET TOP

4.3.4 Installing the TB1 Board

1. Install the TB3 board (2) to the HOLDER SW(1) and secure it with a screw (3) (1.7x3).

CHECK POINT

Install the HOLDER SW to the CABINET FRONT so that the lever part of the LEVER SW goes between the HOLDER SW and TB3 board.

2. Install the HOLDER SW to the CABINET FRONT and secure it with a screw (4) (1.7x5).
3. Connect the ASSY. WIRE (5) to the connector CN545 of the ST1 board.

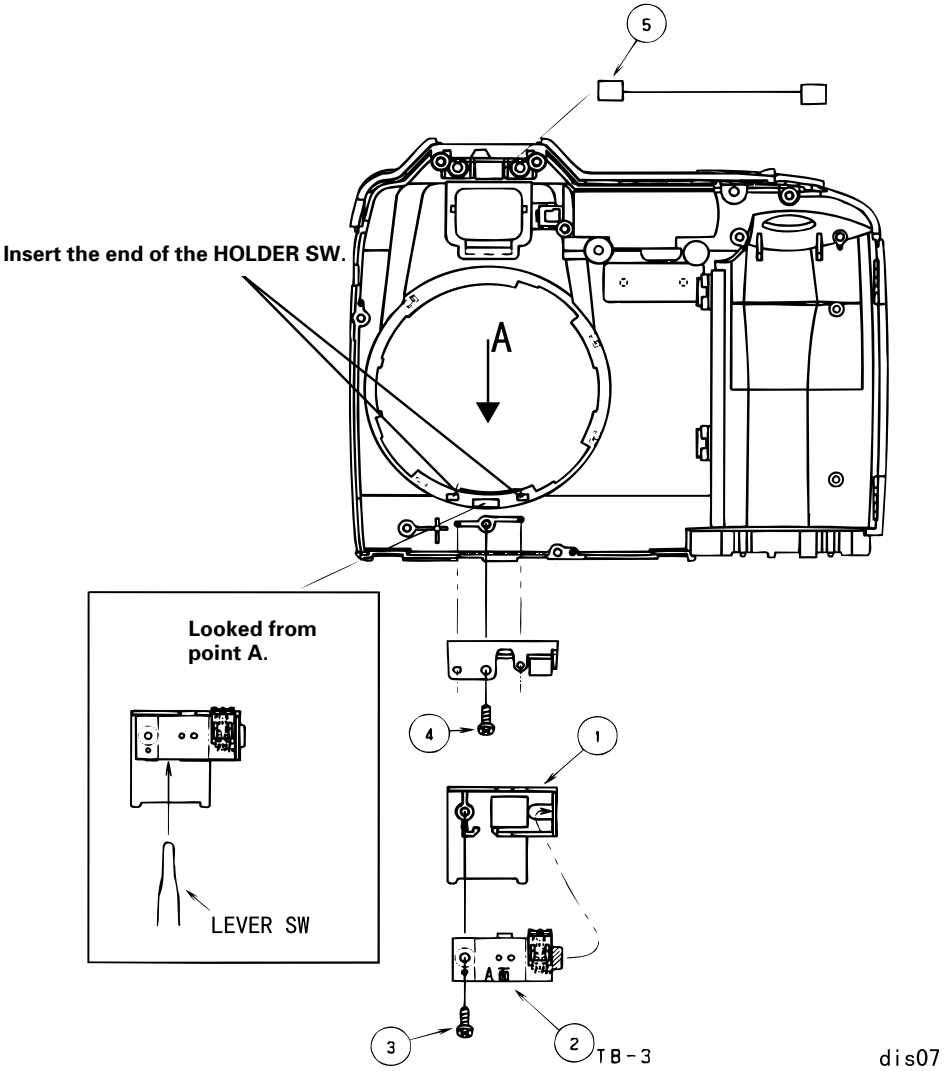


Figure 4-10. Installing the TB1 Board

4.3.5 Installing the Board Unit

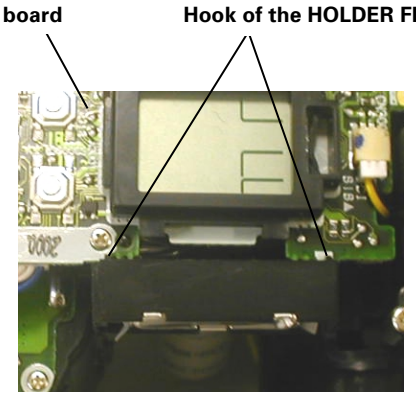
1. Install the STAND (1) to the board unit and secure it with 1 screw (2) (1.5x5).
2. Connect the harness from the SY1 board to the connector of the TB3.
3. Install the board unit to the CABINET FRONT.
4. Connect the harness of the ST1 board to the connector CN104 of the CA2 board.
5. Secure the HOLDER LENS to the CABINET FRONT with 3 screws (3) (1.7x5).

CAUTION

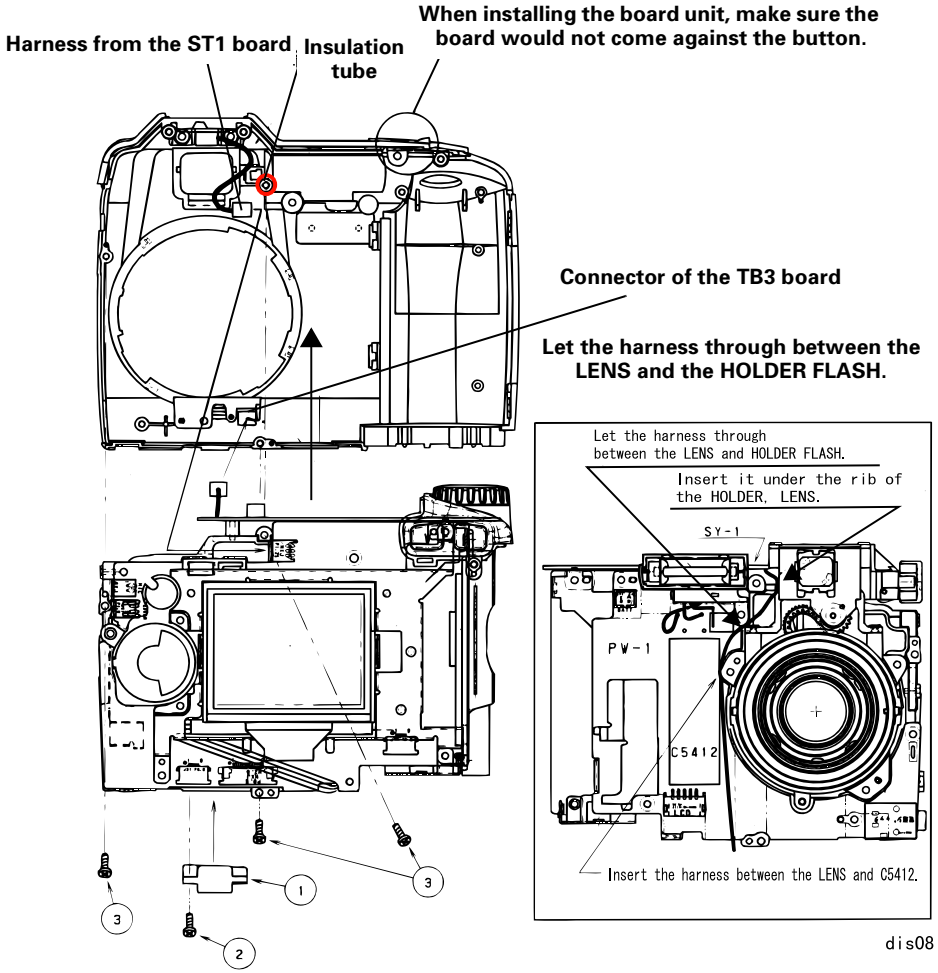
Make sure that the CABINET FRONT has the insulation tube. If there is no tube, the strobe voltage will be leaked out to the conductive plastic CABINET and may result in the strobe failure.

CHECK POINT

Be sure to latch the hooks (2 points) of the HOLDER FLASH to the SY1 board as shown below.



dis09


When installing the board unit, make sure the board would not come against the button.
Harness from the ST1 board
Insulation tube
Connector of the TB3 board
Let the harness through between the LENS and the HOLDER FLASH.
Let the harness through between the LENS and HOLDER FLASH.
Insert it under the rib of the HOLDER, LENS.
SY-1
PW-1
C5412
Insert the harness between the LENS and C5412.
1
2
3
3

dis08

Figure 4-11. Installing the Board Unit

4.3.6 Installing the CABINET BACK

1. Install the LENS FPC to the CA2 board.
2. Connect the FPC from the CABINET BACK to the connector CN116 of the CA2 board and install the CABINET BACK to the CABINET FRONT.
3. Secure the CABINET BACK with 2 screws (1) (1.7x5).

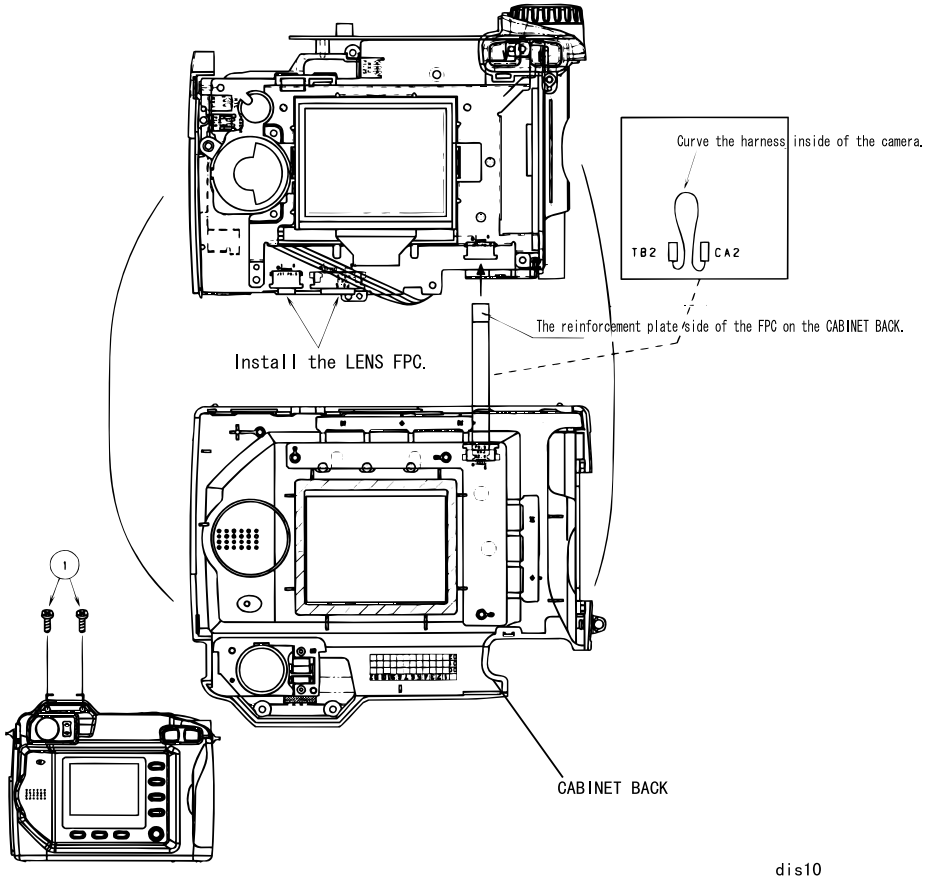


Figure 4-12. Installing the CABINET BACK

CHAPTER

5

ADJUSTMENT

5.1 Overview

This chapter describes various adjustments required for PhotoPC 3000Z. Refer to the table below and perform the appropriate adjustment whenever needed.

CAUTION

For this product, there are two repair levels; first maintenance and 2nd maintenance. The service for second maintenance is allowed to be done only by the service center equipped with special instruments for adjustment. We do not guarantee the repair result performed by the others.

Table 5-1 shows adjustment items required after replacing the parts and the repairing range accepted in the general field.

Table 5-1. 1st / 2nd Level Maintenance (at Board Replacement)

No.	Replacing Parts	Adjustment Items	Category
1	CA1 Board	1. Initial operation 2. Lens adjustment 3. AWB adjustment 4. Color matrix adjustment 5. CCD defect detect adjustment 6. LCD panel adjustment Note: Observe the order.	2nd maintenance
2	CA2 Board	Same as CA1 Board.	2nd maintenance
3	Lens assembly	1. Lens adjustment 2. AWB adjustment 3. Color matrix adjustment 4. CCD defect detect adjustment Note: Observe the order.	2nd maintenance
4	CCD	Same as lens assembly.	2nd maintenance
5	LCD (monitor)	LCD panel adjustment • LCD H AFC adjustment • LCD Gain adjustment • LCD RGB Offset adjustment • LCD Red Brightness adjustment • LCD Blue Brightness adjustment	1st maintenance
6	SY1 Board	Note: When replacing the terminals on SY1 board, perform the following adjustment. (2nd maintenance) Observe the order except for the LCD panel adjustment. 1. Lens adjustment 2. AWB adjustment 3. Color matrix adjustment 4. CCD defect detect adjustment	1st maintenance
7	PW1 Board	Note: When replacing the terminals on PW1 board, perform the following adjustment. (2nd maintenance) Observe the order except for the LCD panel adjustment. 1. IC501 oscillation frequency adjustment 2. 5.1V (D) voltage adjustment 3. 13.0V (L) voltage adjustment 1 4. Lens adjustment 5. AWB adjustment 6. Color matrix adjustment 7. CCD defect detect adjustment	1st maintenance

5.1.1 Preparation for Adjustment

This section describes how to set up the camera and PC before adjustment. Follow the procedures below and complete setting up. Prepare PC with Windows95 or later. (See the caution below.)

WARNING

- **Remove the battery and plug off the AC adapter before disassembling the camera.**
- **The electrolytic capacitor (C5412) mounted on PW1 board is for flash strobe and set to be charged automatically whenever the power is ON. Due to this, it may cause electric shock during the service procedure. When repairing, be sure to discharge the camera, using the cement resistance. (See Figure 4-2, "Discharging Electrolytic Capacitor".)**

CAUTION

Host computer should meet the following specifications.

- **PC/AT compatible PC with more than 486 CPU**
- **FD drive for 3.5 inch 2HD**
- **Standard RS-232C**
- **RAM: 8MB or more**
- **HDD drive: 15 MB or more**
- **VGA or AVGA monitor with at least 256-color display.**

If you try to boot the program with the camera off, the program indicates "Camera is not connected." and becomes error condition.

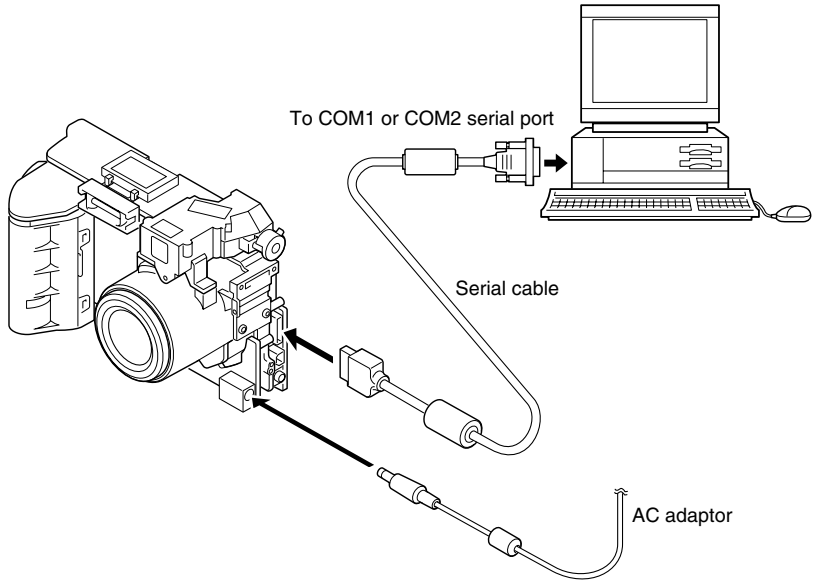
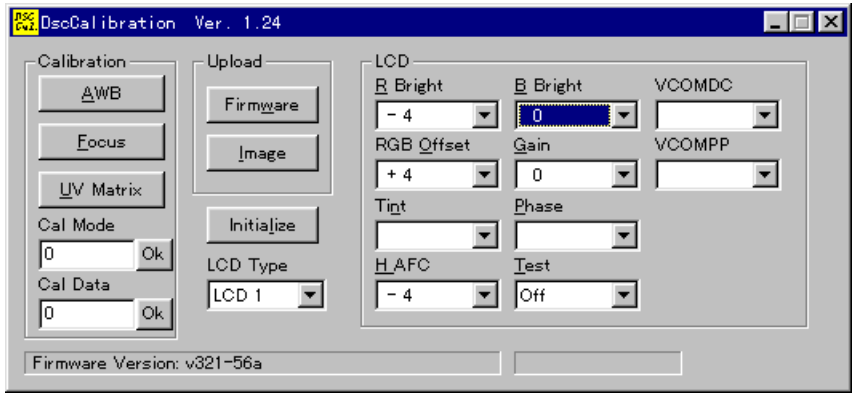


Figure 5-1. Set-up Before Adjustment

1. Turn off both camera and computer.
2. Locate the port cover on the side of the camera. Press on the arrows and slide the cover down to open it.
3. Line up the arrow on the cable connector with the notch on the camera's serial port. Insert the connector.
4. Locate a serial port on the back of your computer. You may have two serial ports labeled COM1 and COM2, or the ports may be labeled with icons. If you have two serial ports available, use port 1 to connect your camera.
5. Line up the serial connector on the cable with one of the serial ports on your computer, and insert the connector.
6. Turn on the camera and your computer system.
7. Insert the attached FD which has the adjustment program into your PC.
8. Double-click "DSCCalDi.exe" The program will be automatically started.

CAUTION

- **If you try to boot the program with the camera off, the program indicates "Camera is not connected." and becomes error condition.**
- **To stabilize the brightness, let the color viewer alone for 30 minutes (idling) before usage after power is turned on.**



adj13

Figure 5-2. Adjustment Program Initial UI

5.2 Adjustment

5.2.1 Initial Operation

This section explains the initial operation required before the adjustment. Unlike EPSON previous models, the various settings will not be cleared by initialization for PhotoPC 3000Z. Initialization only clears the memory (image storage field).

CAUTION

Perform initialization before uploading the firmware. If you upload the firmware when the memory is full of data (taken images), error may be indicated.

1. Complete set-up before the adjustment. (See "Preparation for Adjustment".)
2. Press the initialize button on the program. The confirmation screen will appear.

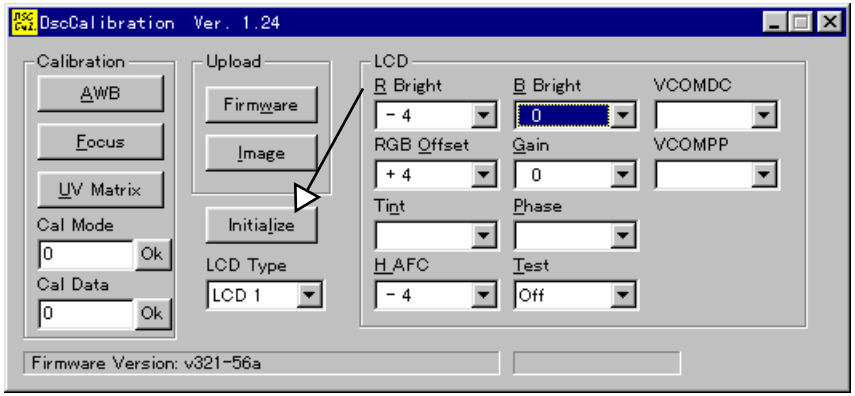


Figure 5-3. Program Screen When Initial Operation is Selected.

3. Select "Y" and perform initialization.
4. ★ mark on the camera, which indicates the resolution selection, moves for 20 seconds. (This period may vary according to the image data size currently stored. The timing that the ★ mark on the camera starts moving lags behind the timing that the program indicates its completion. When the program indicates it is completed, you can take off AC cable and serial communication cable.)
5. Click OK on the screen.

adj10

Figure 5-4. Program Screen When Initialization is Completed.

5.2.2 PW1 Board Adjustment

Adjustment is necessary when you replaced certain parts on the PW1 board, which is described in this section, but not required when you replaced PW1 board.

5.2.2.1 PW1 Board Measurement / Adjustment Points

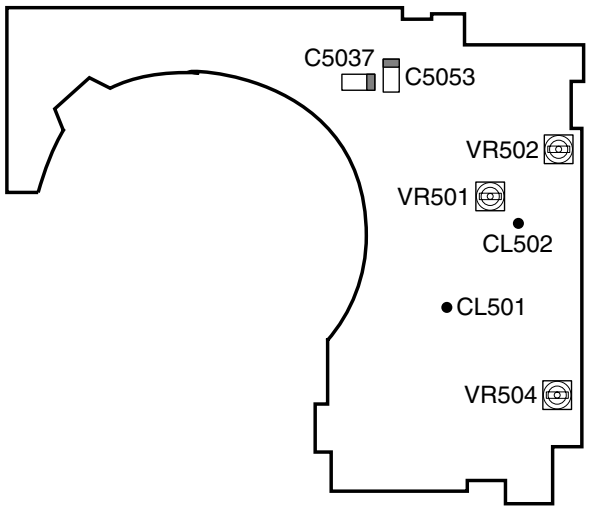


Figure 5-5. Measurement Points / Adjustment Points

PREPARATION

1. Remove the SY1 board and holder battery.
2. Connect the SY1 board again.

NOTE: *The harness connecting SY1 board and TB1 board may not be connected.*

3. Insert the CompactFlash card.
4. Turn on the power switch, and then set to the LCD mode. (To indicate the through image on the LCD.)

5.2.2.2 IC501 Oscillation Frequency Adjustment

SETTING

- ☐ Measuring point: CL501 or CL502
- ☐ Measuring equipment: Frequency counter
- ☐ Adjustment location: VR501
- ☐ Adjustment value: ±200 1kHz

ADJUSTMENT METHOD

Adjust with VR501 to 200 ±1 kHz.

NOTE: *If this adjustment value is out of the range, radiation noise may increase.*

5.2.2.3 5.1V (A) Voltage Adjustment

SETTING

- ☐ Measuring point: CL5037
- ☐ Measuring equipment: Digital voltmeter
- ☐ Adjustment location: VR502
- ☐ Adjustment value: 5.10±0.05V

ADJUSTMENT METHOD

Adjust with VR502 to 5.10 ±0.05 V.

NOTE: *Analog voltage 15.1V(A), -7.6V(A), 3.85V(A) also adjusted at the same time.*

5.2.2.4 13.0V (L) Voltage Adjustment

This is LCD panel voltage adjustment.

SETTING

- ☐ Measuring point: C5053
- ☐ Measuring equipment: Digital voltmeter
- ☐ Adjustment location: VR505
- ☐ Adjustment value: 13.00±0.05V

ADJUSTMENT METHOD

Adjust with VR507 to 13.00 ±0.05 V.

NOTE: *15.5V(L) and 3.7V(L) are also adjusted at the same time.*

5.2.3 Lens Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode

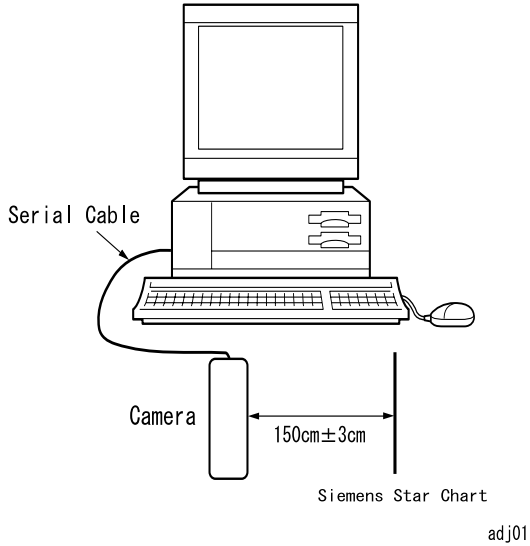


Figure 5-6. Lens Adjustment

ADJUSTMENT CONDITION

- ☐ Siemens star chart (A3)
- ☐ Fluorescent light illumination with no flicker (incandescent light cannot be used.)
- ☐ Illumination above the subject should be 400 lux ± 10%

ADJUSTMENT METHOD

1. Set the siemens star chart 150 cm ± 3 cm so that it becomes center of the screen.
2. Double-click on the DscCalDi124.
3. Click the “Focus”, and Click the “Yes”.

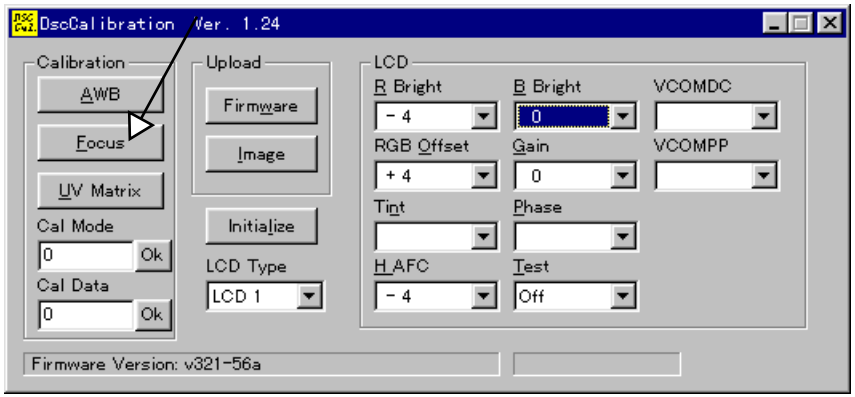


Figure 5-7. Lens Adjustment Button Location

4. Adjustment value will appear on the screen.

☐ Adjustment level
STD.AFOPS=0

☐ Error: If STD.AFOPS is not “0”, it is an error.

■ Error example
STD.AFPOS=1: failure in detecting lens unit home position.

5. Click the OK.

5.2.4 AWB Adjustment

PREPARATION

☐ Power switch: ON

☐ Dial switch: Communication mode

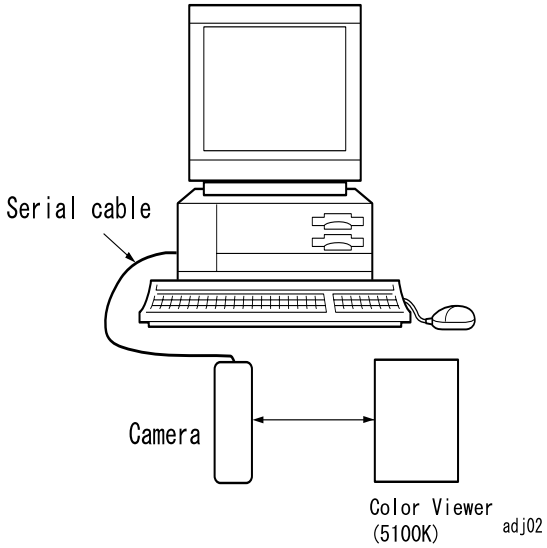


Figure 5-8. AWB Adjustment

ADJUSTMENT METHOD

1. When setting the camera in place, set it to an angle so that nothing appears in any part of the color viewer except the white section. (Do not enter any light.)
2. Double-click on the DscCalDi124.

3. Click the “AWB”, and click the “Yes”.

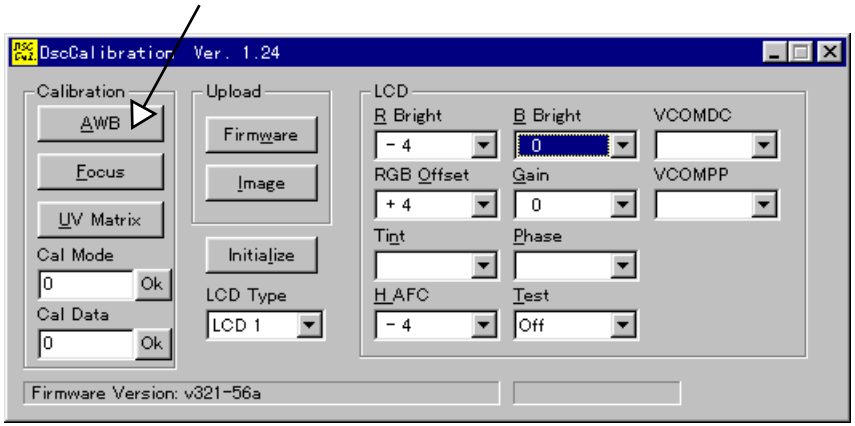


Figure 5-9. AWB Adjustment Button Location

4. AWB adjustment value will appear on the screen. WC=Y, U, V

☐ Adjustment Value

- Y=128 ± 20
- U=128 ± 20
- V=140 ± 20

5. Click the OK.

5.2.5 Color Matrix Adjustment

When adjusting the color matrix, it is also checking the aperture operation.

PREPARATION

☐ Power switch: ON

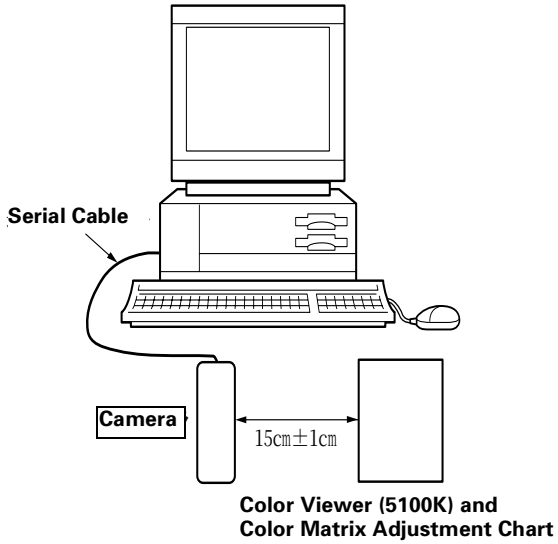
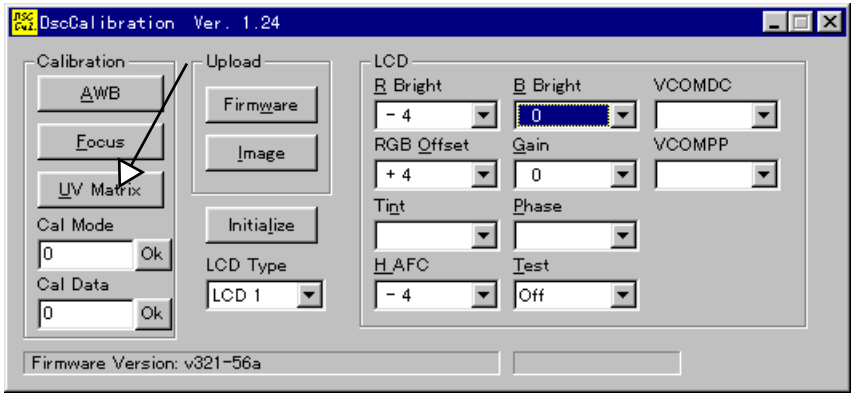


Figure 5-10. Color Matrix Adjustment

ADJUSTMENT METHOD

1. Set the color adjustment chart to the color viewer. (Do not enter any light.)
2. Set the color adjustment chart so that it becomes center of the screen.
3. Double-click on the DscCalDi124.

4. Click the “UV Matrix”, and Click the “Yes”.



adj14

Figure 5-11. Color Matrix Adjustment Button Location

5. Matrix adjustment values will appear on the screen. UD=A, B, C, D

☐ Adjustment level

- ■ When all of A, B, C, D show 3 digit figure, it is OK.

☐ Error

- ■ A, B, C, D=1

6. Click the OK.

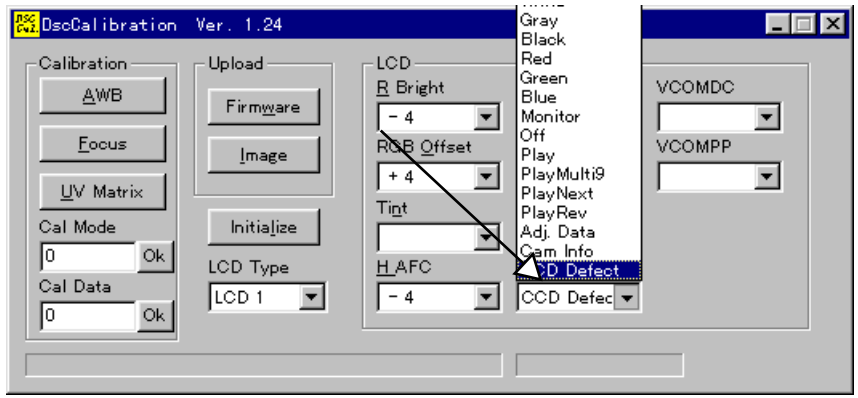
5.2.6 CCD Defect Detect Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode
- ☐ Lens cover switch: Closed

ADJUSTMENT METHOD

1. Double-click on the DscCalDi124.
2. Click the “CCD Defect Detection”, and click the “Yes”.



adj16

Figure 5-12. CCD Defect Detect Adjustment

3. After the adjustment is completed, if there is any defection, at most 512 defection is indicated x, y matrix.)

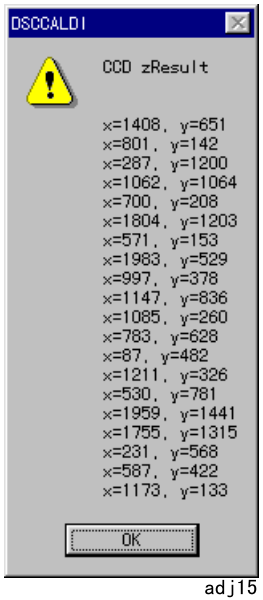


Figure 5-13. CCD Defect Detect Adjustment Result

5.2.7 LCD Panel Adjustment

This adjustment is required when replacing LCD. The measurement / adjustment points of CA2 board is shown below.

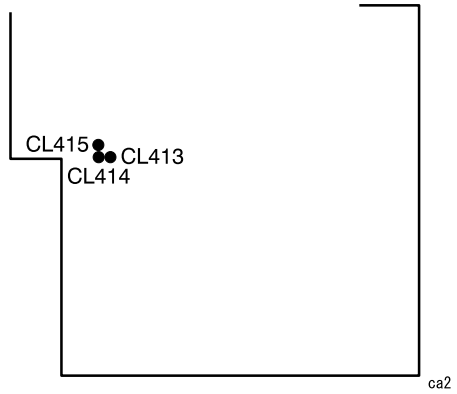


Figure 5-14. Measurement / Adjustment Points

5.2.7.1 LCD H AFC Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode

ADJUSTMENT METHOD

1. Double-click on the DscCalDi124.
2. Select "0" on the LCD "H AFC".

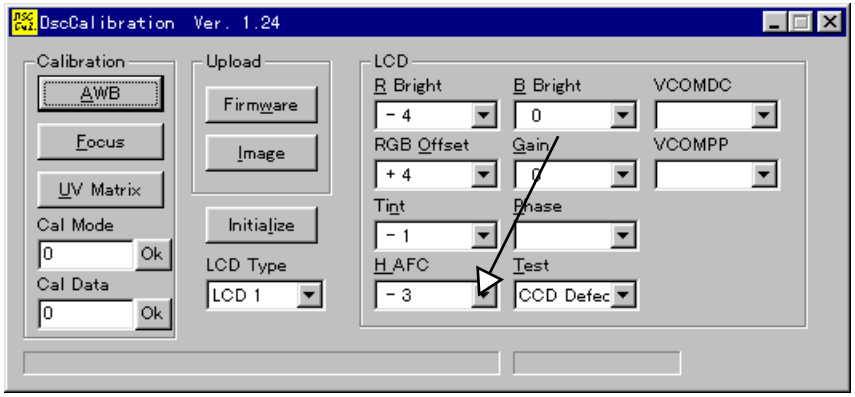


Figure 5-15. LCD H AFC Adjustment Button Location

3. While looking at the LCD monitor, adjust "H AFC" so that the edge of the LCD adjustment frame are the same distance from the left and right edge of the LCD screen. (A= B)

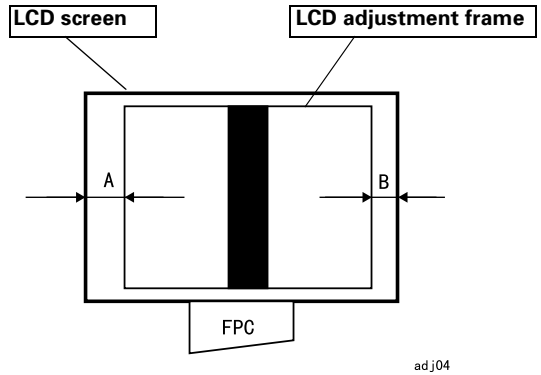


Figure 5-16. LCD H AFC Adjustment

5.2.7.2 LCD Gain Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode

ADJUSTMENT METHOD

1. Double-click on the DscCalDi124.
2. Select "0" on the LCD "Gain".

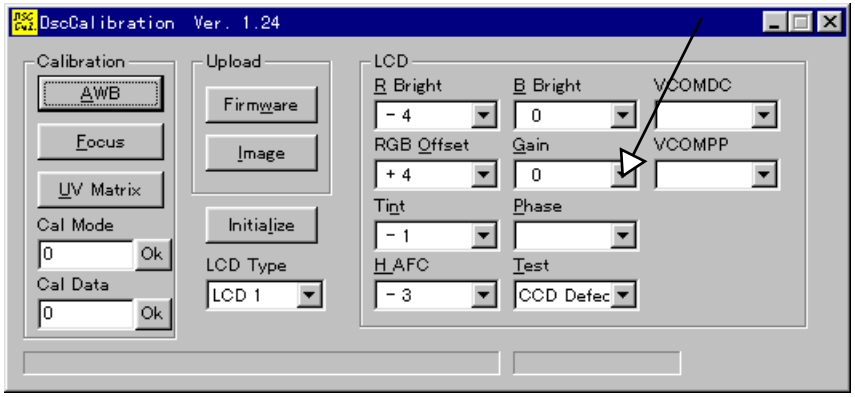


Figure 5-17. LCD Gain Adjustment Button Location

ADJUSTMENT METHOD

Adjust LCD "Gain" so that the amplitude of the CL415 waveform becomes 1.0V±0.1Vp-p.

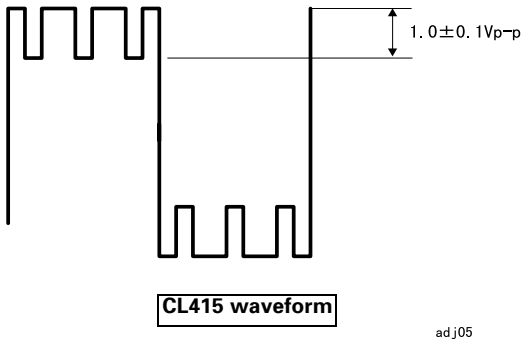


Figure 5-18. Gain Adjustment

5.2.7.3 LCD RGB Offset Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode

ADJUSTMENT METHOD

1. Double-click on the DscCalDi124.
2. Select “0” on the LCD “RGB Offset”.

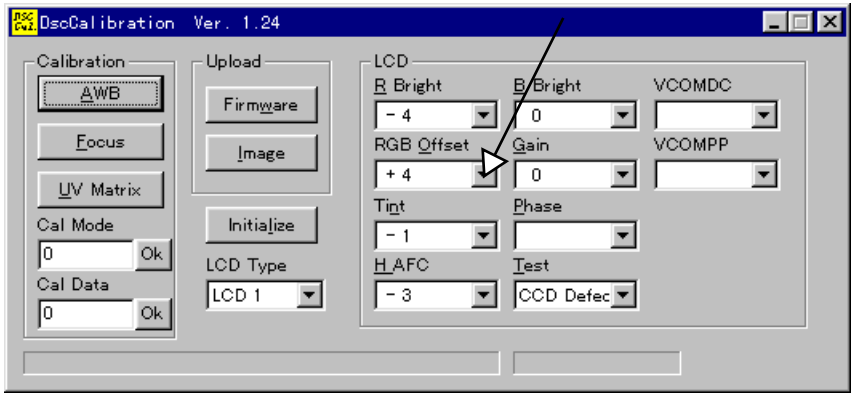


Figure 5-19. LCD RGB Offset Adjustment Button Location

ADJUSTMENT METHOD

Adjust LCD “RGB Offset” so that the amplitude of the CL415 waveform becomes 4.6V±0.1Vp-p.

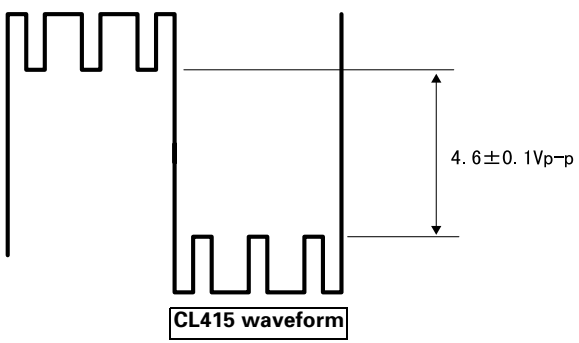


Figure 5-20. RGB Offset Adjustment

CAUTION

Perform LCD RGB Offset adjustment after LCD Gain adjustment. (See “LCD Gain Adjustment” on page 82)

5.2.7.4 LCD Red Brightness Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode

ADJUSTMENT METHOD

1. Double-click on the DscCalDi124.
2. Select "0" on the LCD "R Brightness".

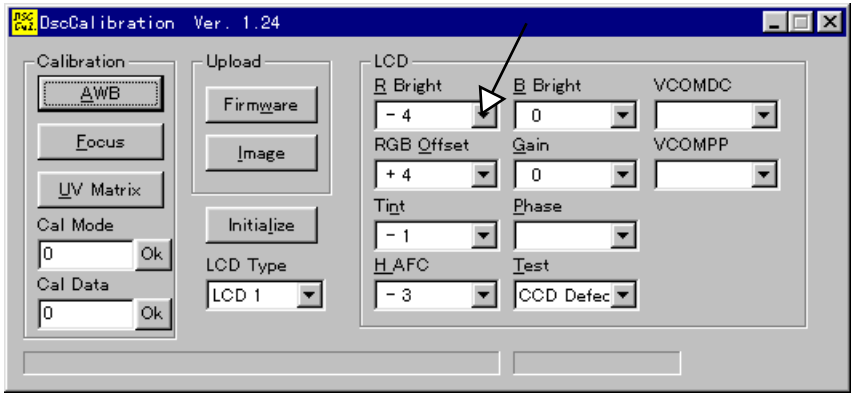


Figure 5-21. LCD Red Brightness Adjustment Button Location

ADJUSTMENT METHOD

Adjust LCD "R Bright" so that the amplitude of the CL414 waveform becomes VG ± 0.1 Vp-p with respect to the CL415 (VG) waveform.

CAUTION **Perform this adjustment after LCD Gain adjustment and LCD RGB Offset adjustment. (See "LCD Gain Adjustment" and "LCD RGB Offset Adjustment")**

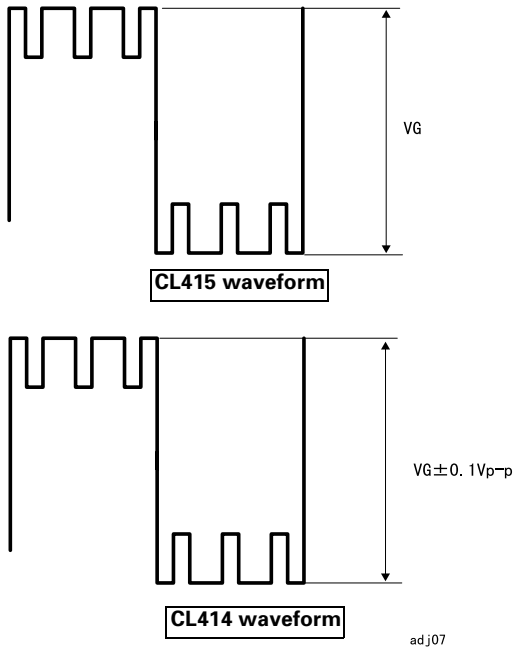


Figure 5-22. Red Brightness Adjustment

5.2.7.5 LCD Blue Brightness Adjustment

PREPARATION

- ☐ Power switch: ON
- ☐ Dial switch: Communication mode

ADJUSTMENT METHOD

1. Double-click on the DscCalDi124.
2. Select “0” on the LCD “B Brightness”.

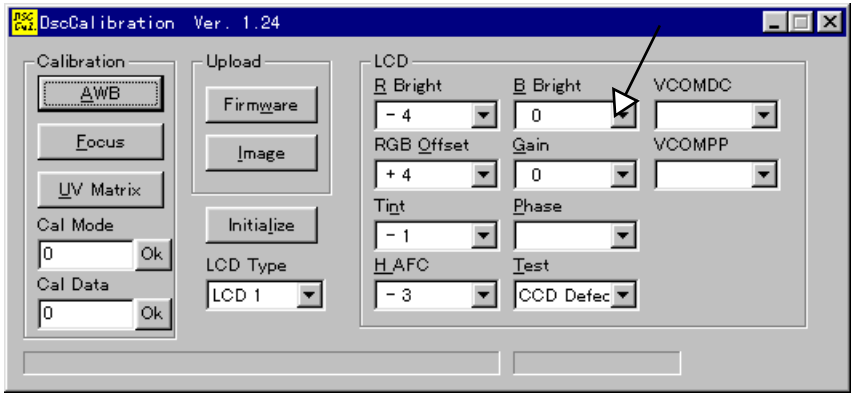


Figure 5-23. LCD Blue Brightness Adjustment Button Location

ADJUSTMENT METHOD

Adjust LCD “B Bright” so that the amplitude of the CL413 waveform is VG ± 0.1 Vp-p with respect to the CL415 (VG) waveform.

CAUTION

Perform this adjustment after LCD Gain adjustment and LCD RGB Offset adjustment. (See “LCD Gain Adjustment” and “LCD RGB Offset Adjustment”)

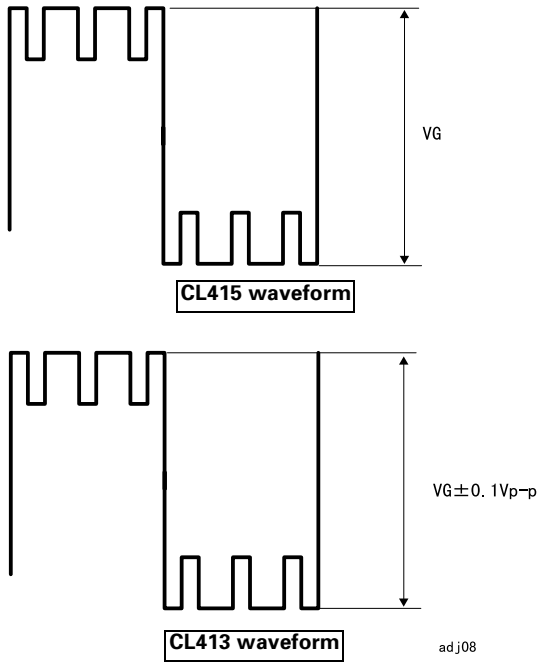


Figure 5-24. Blue Brightness Adjustment

5.2.8 Firmware Upload

1. Complete the setup for the adjustment. (See “Preparation for Adjustment” on page 72.)
2. Copy the firmware provided by EPSON to the hard disk. (Firmware is usually compressed with bin file.)
3. Set the dial switch to “Communication mode”.
4. Select “Firmware” of upload.
5. File open dialog will appear for you to select the place file is stored.

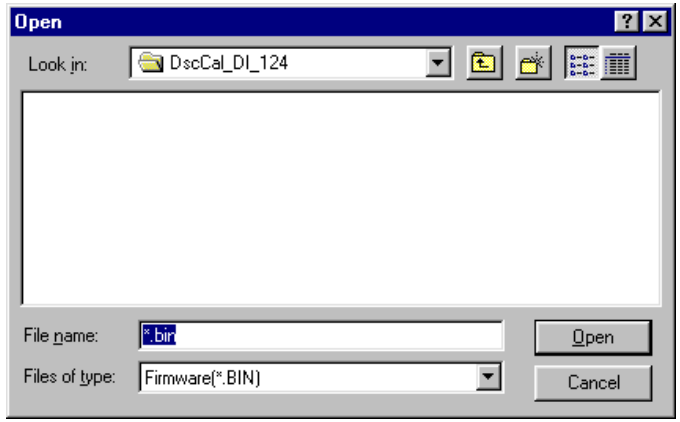


Figure 5-25. Program Screen of Firmware Upload

6. Select the latest firmware and click “open”.
7. LED on the front side of the camera will blink for 20 seconds and notifies you that the upload is being normally performed. (You cannot check this LED when you removed SY1 board.)

CAUTION

- **During the firmware upload, if the power is shut down or if the serial communication cable is taken off, it may result in the defective flash memory. Never perform other operation until “Complete” is indicated.**
- **When performing the firmware upload, Hyper function, direct print function and print mark function will be deleted at the same time. After completing the upload, re-install these 3 functions by using “Uploader” attached with the product.**

8. When it comes close to the Upload completion, the camera beeps once and notifies you that the camera finishes read-in operation and starts writing into Flash Memory operation.

CAUTION

Be careful not to confound this beep sounds that notifies you that the starts writing into Flash Memory operation with the one at the end. Check if the indication on the camera says “Completion”.

9. After a few seconds (1-2 seconds), the writ-in operation is completed and the camera beeps once again. “Complete” is indicated on the program screen to show upload is completed.
10. Press OK button.

5.2.8.1 Firmware Version Check

You can check the firmware version by the following procedure.

1. Pull out CF card.
2. Turn the dial switch to “SETUP” mode.
3. Tune on the power switch while pressing the shutter switch.
4. FIrmware version will be appeared on the LCD monitor.

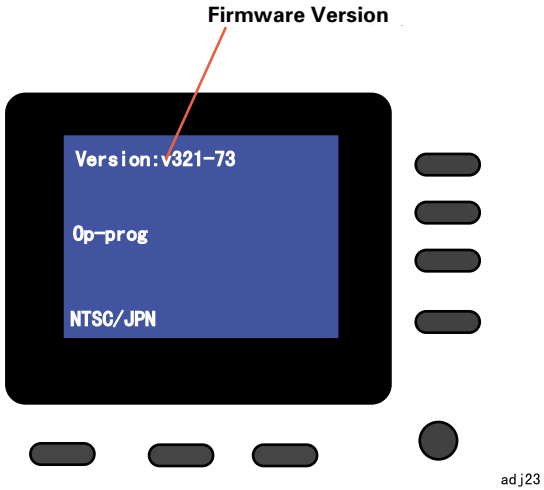


Figure 5-26. Firmware Version Check

5.2.9 Re-installing the Expanded Functions

This section explains how to re-install the expanded functions that is deleted when uploading firmware such as Hyper.

1. Create “op-prog” folder on the PC desktop. (PC must have PCMCIA card slot.)
2. Put the expanded function program in this folder.
3. Insert the PCMCIA adapter with PCMCIA CF card inserted. Adapter is defined as the removal disk.
4. Copy “op-prog” to the Dcim folder in the PCMCIA adapter, using explore.
5. Take the CF card out f PCMCIA and insert it to PhotoPC 3000Z.
6. Turn the power on and turn the dial switch to the “SETUP mode”.
7. Select “install / uninstall the expanded program” on the memory setting screen.
8. Select “install” on “install / uninstall the expanded program” .
9. Press the “Return” switch and get off from the installation screen.

CAUTION

When CF card without expanded function is inserted, “install / uninstall the expanded program” screen of the expanded function will not be appeared.

CHAPTER

6

MAINTENANCE

6.1 Overview

PhotoPC 3000Z requires no specific maintenance (lubrication / adhesion / cleaning).

Camera should be cleaned according to its necessity, however, such as for dust incoming at the repairing service or fingerprint. The following table lists the check items before sending the camera back to users.

6.1.1 Check Items

Check the camera with the following table. If you find any dust or dirt, clean the camera, referring to Ch4. Certain dirt such as dust and fingerprints can be removed by tapping the cellophane tape.

Table 6-1. Check Items

No.	Check Item	OK / NG
1	Check the lens viewer inside / outside if it is dirty with fingerprints etc. Check if any cable such as power supply cable is visible.	☐OK ☐NG
2	Is the operation of the rotary switch smooth? Can you feel it clicked when you click the switch?	☐OK ☐NG
3	Are there any dust or cables visible inside / outside of the flash window?	☐OK ☐NG
4	Is there any fingerprints or dust on the LCD panel surface glass on SY1 board or inside / outside of the acrylic plate of rear cabinet?	☐OK ☐NG
5	Is there any fingerprint or dust on the lens surface?	☐OK ☐NG
6	Is there any fingerprint or dust inside / outside of the LCD monitor window?	☐OK ☐NG
7	Does the battery cover open and close normally?	☐OK ☐NG
8	Is the compact flash card inserted normally?	☐OK ☐NG
9	Is the rubber cover that covers various connectors and serial connectors properly secured to the rear cabinet?	☐OK ☐NG
10	Is the various panel switch operation done properly?	☐OK ☐NG
11	Is the appearance clean?	☐OK ☐NG

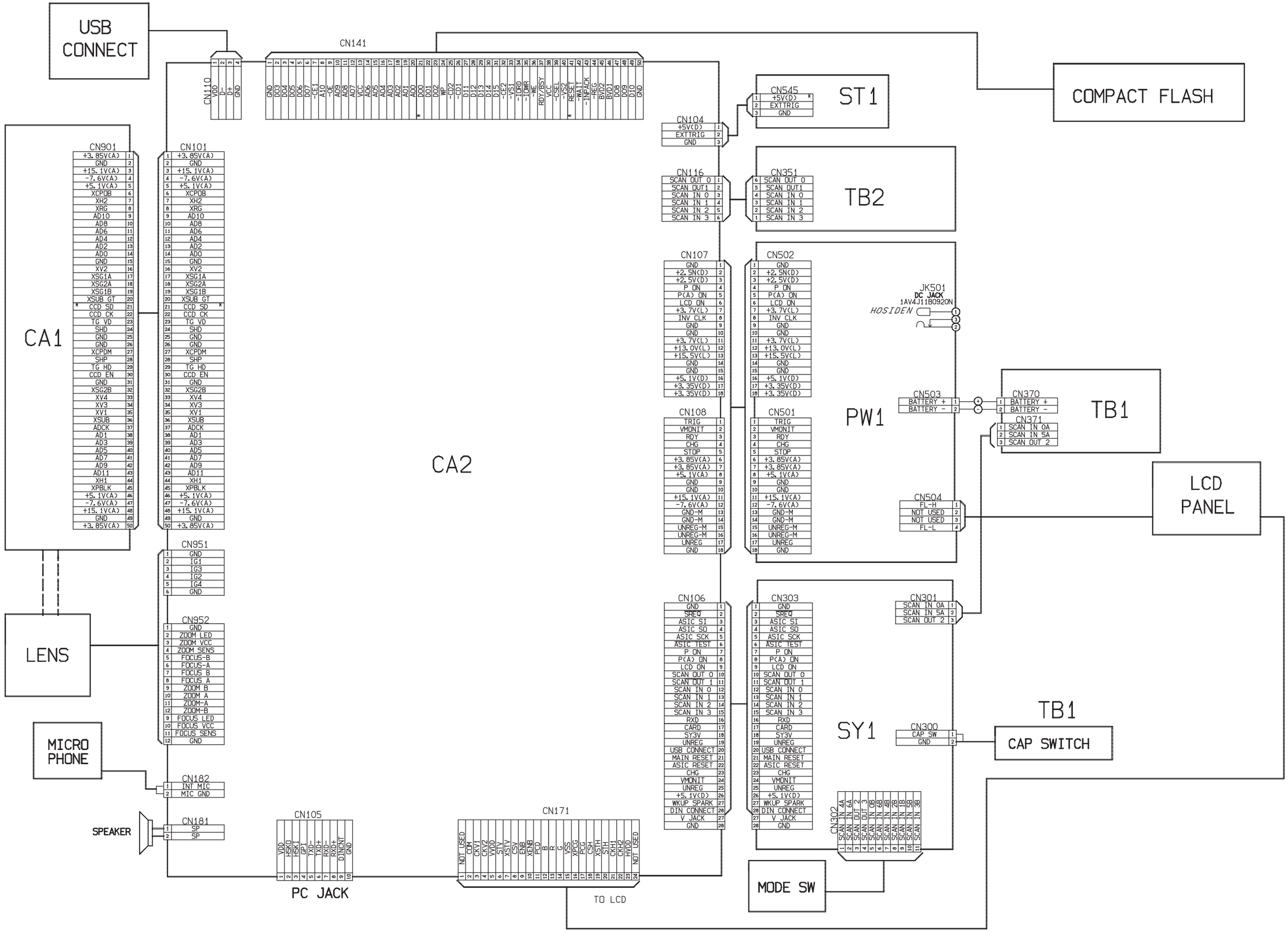
CHAPTER

7

APPENDIX

7.1 Circuit Board Connection Diagram

The next page is the circuit board connection diagram.

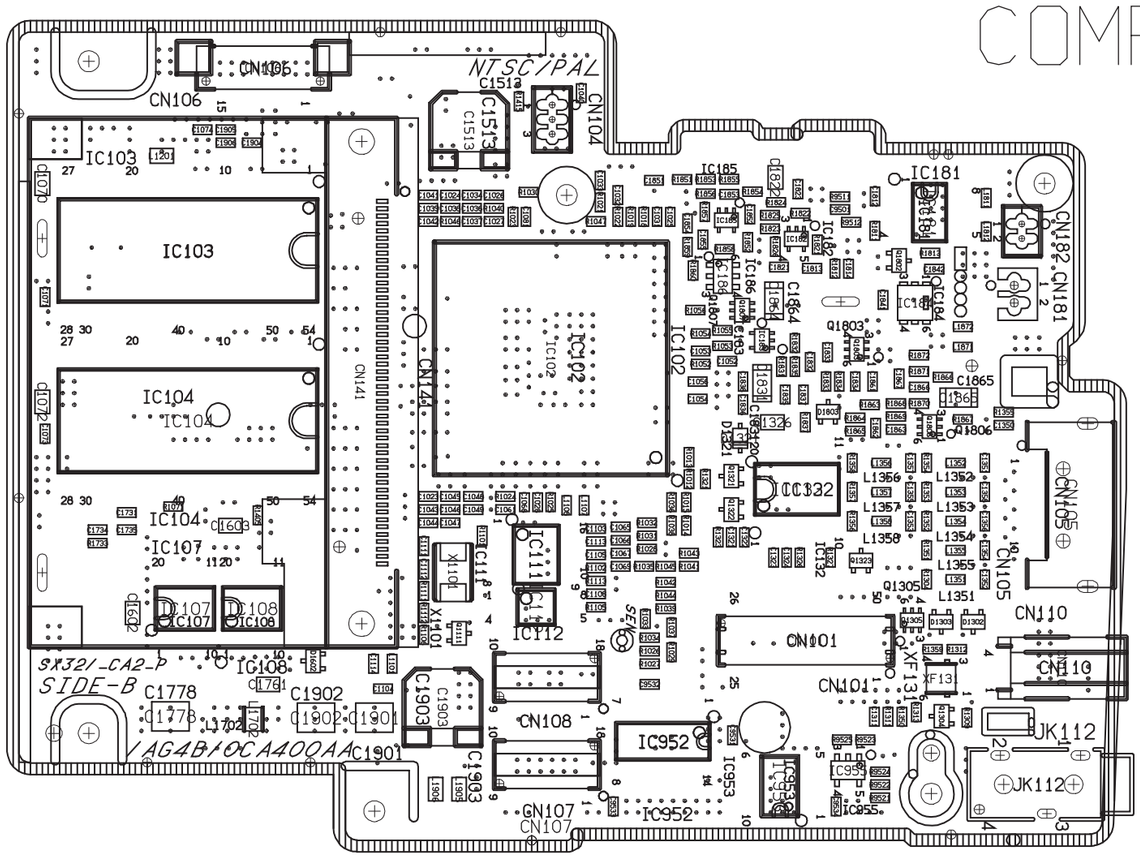

USB CONNECT
CN110
VDD
D-
D+
GND
CN141
COMPACT FLASH
CN545
+5V(D)
EXTTRIG
GND
ST1
CN104
CN116
SCAN OUT 0
SCAN OUT1
SCAN IN 0
SCAN IN 1
SCAN IN 2
SCAN IN 3
CN351
TB2
CN107
CN502
JK501
DC JACK
1AV4J11B0920N
HOSIDEN
CN108
CN501
PW1
CN503
BATTERY +
BATTERY -
CN370
CN371
TB1
CN504
FL-H
NOT USED
NOT USED
FL-L
LCD PANEL
CA1
CN901
CN101
CA2
CN951
CN952
LENS
CN106
CN303
CN301
SY1
CN300
CAP SW
GND
TB1
CAP SWITCH
MICRO PHONE
CN182
INT MIC
MIC GND
SPEAKER
CN181
SP
SP
CN105
PC JACK
CN171
TO LCD
CN302
MODE SW

7.2 Circuit Board Component Layout

This section shows the following circuit board component layout for PhotoPC 3000Z.

- ☐ CA1/2 Circuit Board
- ☐ PW1, TB1/2/3, ST1, SY1 Circuit Board

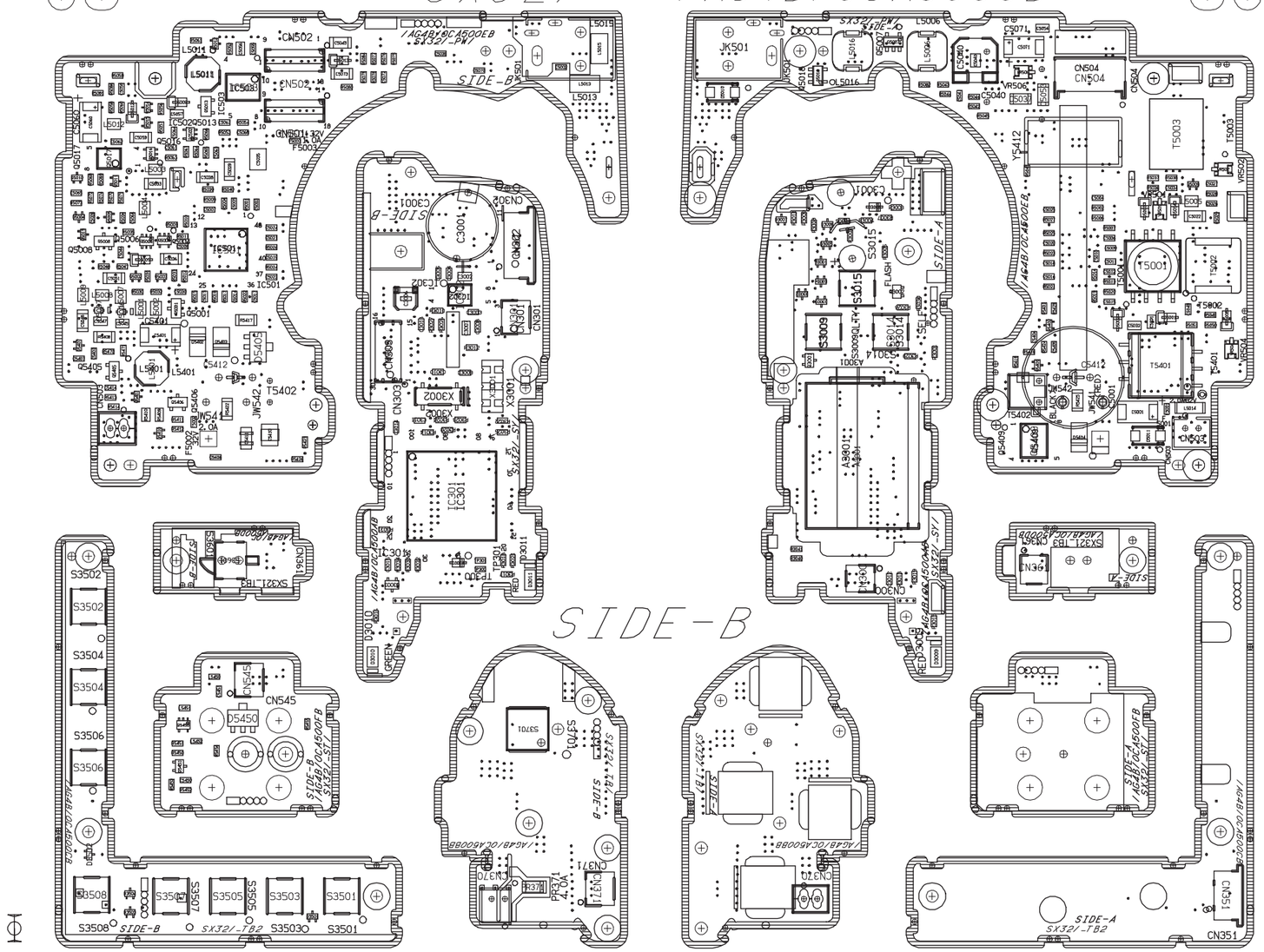
COMPOSITE-1


NTSC/PAL
SX321-CA2-P
SIDE-B
VAG4B/OCA400AA
IC103
IC104
IC107
IC108
IC102
IC111
IC112
IC185
IC181
IC182
IC183
IC184
IC186
IC132
IC952
IC953
IC951
IC101
IC121
IC145
IC144
IC106
IC174
IC175
IC1471
IC1511
IC1512
IC152
IC9505
IC956
CN105
CN110
CN101
CN108
CN107
CN116
CN171
CN181
CN182
CN951
CN104
JK112
C1778
C1902
C1901
C1903
C1739
C1513
C1865
C1864
C9520
C9512
C1519
C1511
C1512
C1515
C1502
C1402
C1701
C1777
C1778
C1779
C1780
C1781
C1782
C1783
C1784
C1785
C1786
C1787
C1788
C1789
C1790
C1791
C1792
C1793
C1794
C1795
C1796
C1797
C1798
C1799
C1800
C1801
C1802
C1803
C1804
C1805
C1806
C1807
C1808
C1809
C1810
C1811
C1812
C1813
C1814
C1815
C1816

/AG4B/OCA5000B

SX321

/AG4B/OCA5000B


SIDE-B
SIDE-A
SIDE-B
SIDE-A
SIDE-B
SIDE-A

7.3 Circuit Diagram

This section shows the following circuit diagrams for PhotoPC 3000Z.

- CA1 Circuit Diagram
- CA2 Circuit Diagram
- SY1 Circuit Diagram
- PW1 Circuit Diagram
- ST1 Circuit Diagram
- TB1 Circuit Diagram
- TB2 Circuit Diagram
- TB3 Circuit Diagram

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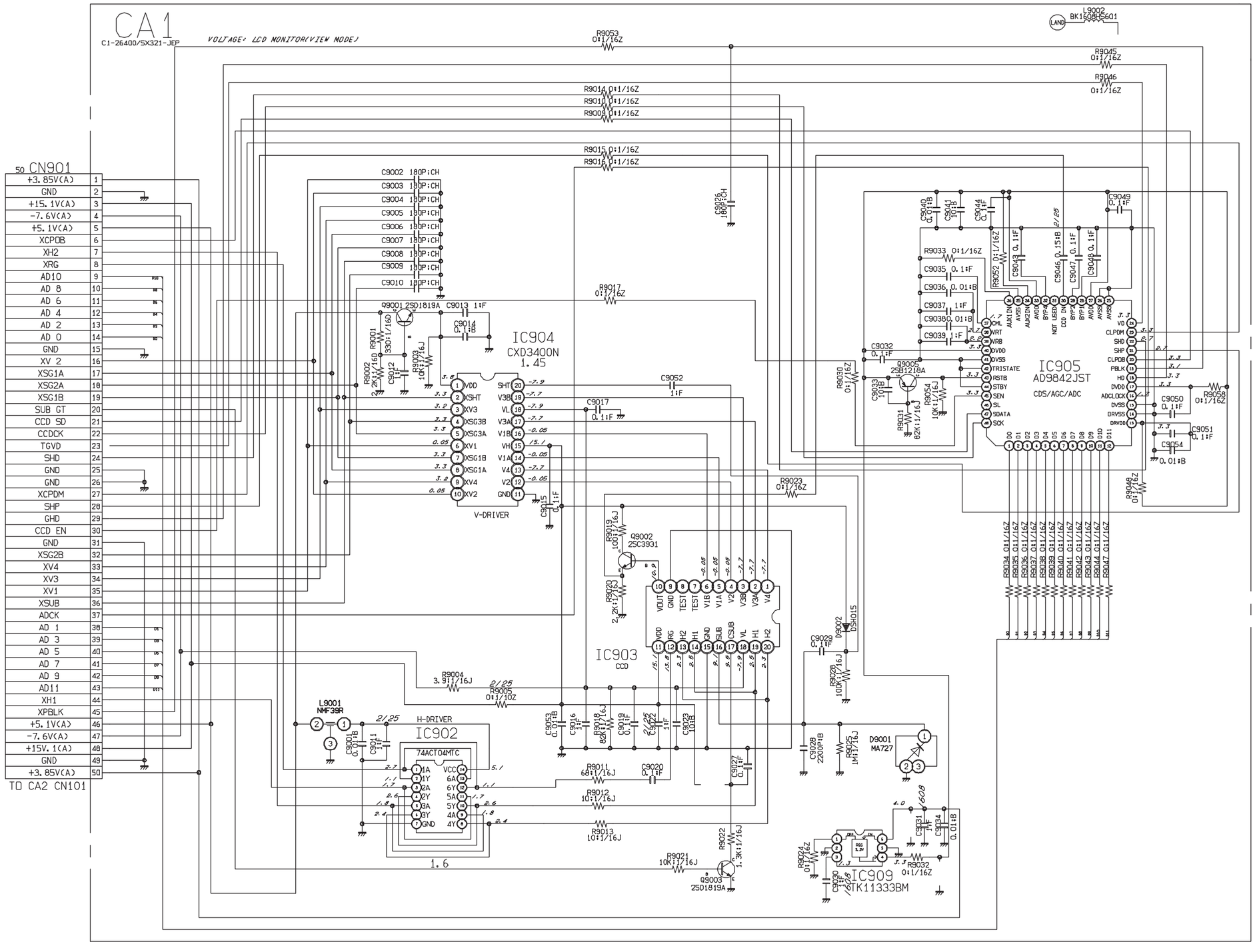

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CA2_MAIN

C2-26400/SX521-JEP

VOLTARE: PLAY AND LCD ON

CPU
IC101
MB86836PMT2-G-BND

IC102
KS5M9U1262CBP
SYSTEM ASIC

CA2_LENS

C2-26403/SX521-JEP

IC951 LB1837M — IRIS DRIVER

IC952 LB1836M — ZOOM DRIVER

IC953 LB1846M — FACUS DRIVCER

REG IC954 S-8520B28MC-NR5-T2

TO LENS

CA2_LCD

C2-26400/SX521-JEP

VOLTARE: PLAY AND LCD ON

IC171 LC4134A-TBM — LCD DRIVER

IC174 TK11330BM — REGULATOR

IC175 TC75ET08FU-P

CN171 — TO LCD

1AV2HL9JC02--- (HOLDER, CF)
SE2PN207R0SE-(BIS) 貝收2

CN141 — TO COMPACT FLASH

IC145 TC7WH2FK — BUFFER

IC146 SN74LV273ADBTR — BUFFER

IC106 SN74LV273ADBTR — BUFFER

CN116 — TO TB2 CN351

CN106 — TO SY1 CN303

IC121 M29W160ET-90PN — PROGRAM FLASH

IC103 SDRAM HY57V651620BLTC-10

IC104 SDRAM HY57V651620BLTC-10

IC111 IMSG568ATB — CLOCK GEN

IC112 IMSG587DTB — CLOCK GEN

IC153 TK11450M — REG

IC1301 TK11433M — DRIVER RECEIVER

IC1302 MA147-TX

IC1303 LM2902N

CN105 — RS232C

CN110 — TO USB

CN119

CN181 — SP

CN182 — TO MIC

CN104 — TO ST1 CNS45

CN107 — TO PW1 CNS02

CN108 — TO PW1 CN501

CN101 — TO CA1 CN901

SY1

Y1-26400/SX321-JEP

VOLTAGE: PLAY AND LCD ON

TO TB3 CN361

2 CN300
- CAP SW 1
- GND 2

TO TB3 CN361

3 CN301
- SCAN IN 0A 1
- SCAN IN 5A 2
- SCAN OUT 2 3

TO TB1 CN371

11 CN302
- SCAN IN 4A 1
- SCAN IN 6A 2
- SCAN OUT 2 3
- SCAN OUT 3 4
- SCAN IN 0B 5
- SCAN IN 6B 6
- SCAN IN 4B 7
- SCAN IN 2B 8
- SCAN IN 1B 9
- SCAN IN 5B 10
- SCAN IN 3B 11

TO MODE SWITCH

IC301
UPD78P064
8bit MICRO PROCESSOR

CN303 30
- 1 GND
- 2 SREQ
- 3 ASIC SI
- 4 ASIC SO
- 5 ASIC SCK
- 6 ASIC TEST
- 7 P ON
- 8 P(A) ON
- 9 LCD ON
- 10 SCAN OUT0
- 11 SCAN OUT1
- 12 SCAN IN0
- 13 SCAN IN1
- 14 SCAN IN2
- 15 SCAN IN3
- 16 RXD
- 17 CARD
- 18 SY3V
- 19 UNREG
- 20 USB CONNECT
- 21 MAIN RESET
- 22 ASIC RESET
- 23 CHG
- 24 VMONT
- 25 UNREG
- 26 NC
- 27 WKUP SPARK
- 28 DIN CONNECT
- 29 V JACK
- 30 GND

TO CA2 CN106

FLASH REFLECTOR

JW541 XAN

JW543 TRG

JW542 XKT

T5402 1AV4L17B0400

T5401 1AV4L17B0050G

D5405 CR08A5-8 (SCR)

D5409 CY20AJ-6

CHG

RDY

STOP

TRIG

VMONIT

POWER FLASH

DC JACK JK501 1AV2J11B0920N

2 CN503 BATTERY + / BATTERY -

BATTERY 1AV4J10HG020N

FOR ANALOG CIRCUIT

CH1

T5001 1AV4L51B3120G

+15.1V(A)

-7.6V(A)

+5.1V(A)

+5.1V(D)

+3.85V(A)

DIGITAL 3.4V

CH4

DIGITAL 2.5V

CH2

+3.35V(D)

+2.5V(D)

P ON

P(A) ON

LCD ON

INV CLK

+3.7V(CL)

+13.0V(CL)

+15.5V(CL)

+5.1V(CD)

+3.35V(CD)

1AV4J11HK180G CN501

1	TRIG
2	VMONIT
3	RDY
4	CHG
5	STOP
6	+3.85V(A)
7	+3.85V(A)
8	+5.1V(A)
9	GND
10	GND
11	+15.1V(A)
12	-7.6V(A)
13	GND-M
14	GND-M
15	UNREG-M
16	UNREG-M
17	UNREG
18	GND

TO CA2 CN108

1AV4J11HK180G CN502

1	GND
2	+2.5V(CD)
3	+2.5V(CD)
4	P ON
5	P(A) ON
6	LCD ON
7	+3.7V(CL)
8	INV CLK
9	GND
10	GND
11	+3.7V(CL)
12	+13.0V(CL)
13	+15.5V(CL)
14	GND
15	GND
16	+5.1V(CD)
17	+3.35V(CD)
18	+3.35V(CD)

TO CA2 CN107

IC501 BA9737KV SWITCHING CONTROL

CAP-L4 CAP-H4 OUT-4 DTC-4 SCP-4 NON-4 INV-4 FB-4 DTC-3 SCP-3 INV-3 FB-3 STB-4 STB-3 RT CT SCP GND VREF VCC STB STB-2 STB-1 DTC-2 FB-2 INV-2 SCP-2 NON-1 INV-1 FB-1 DTC-1 BIAS-1 CAP-H1 OUT-1 CAP-L1 VCC-12 BIAS-2 CAP-H2 CAP-L2 OUT-2 P-GND OUT-3 CAP-L3 CAP-H3 BIAS-3 VCC-34 BIAS-4 CAP-L4

T5002 1AV4L51B3130G

CH3 FOR LCD

CH5 FOR BACK LIGFHT

IC503 MB3800PNF SWITCHING CONTROL

IN SCP VCC BR/CTL FB OSC GND OUT

SYNC

T5003 1AV4L51B2000G

CN504 (TO LCD)

1	FL-L
2	GND
3	
4	FL-H

1AV4J10B1280Z

PW1 PI-2640/SX321-JEP

VOLTAGE:AC ADAPTOR IN(CAMERA MODE)

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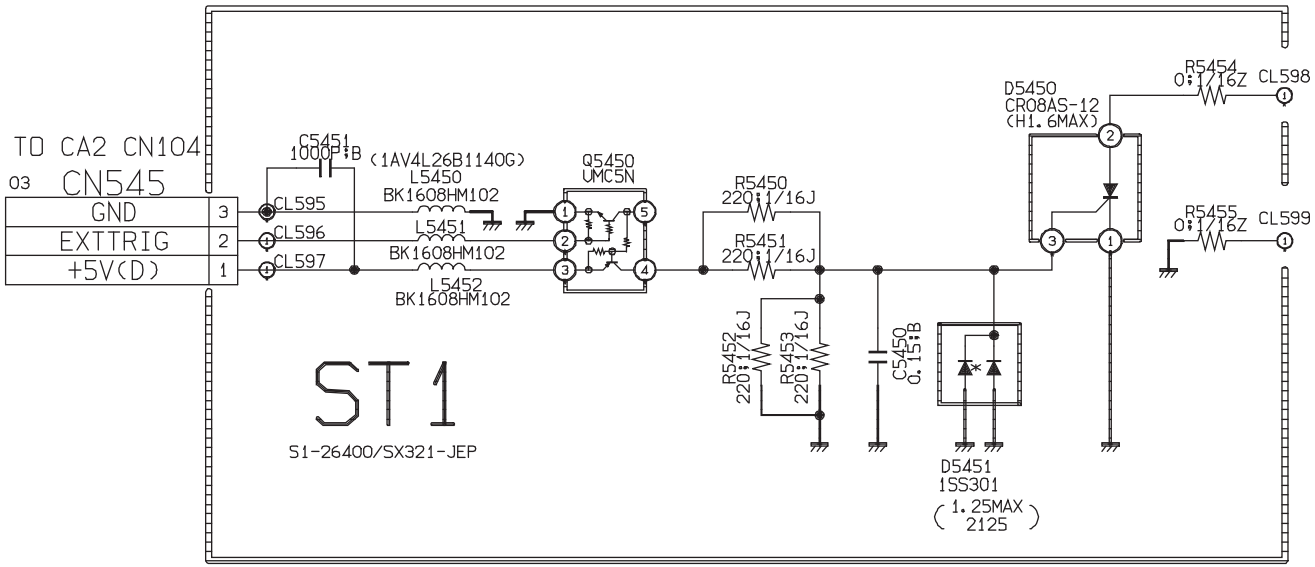
TO CA2 CN104
03 CN545
GND 3
EXTTRIG 2
+5V(D) 1
CL595
CL596
CL597
C5451
1000P:B
(1AV4L26B1140G)
L5450
BK1608HM102
L5451
BK1608HM102
L5452
BK1608HM102
Q5450
UMC5N
R5450
220:1/16J
R5451
220:1/16J
R5452
220:1/16J
R5453
220:1/16J
C5450
0.15:B
D5450
CR08AS-12
(H1.6MAX)
R5454
0:1/16Z
CL598
R5455
0:1/16Z
CL599
D5451
1SS301
(1.25MAX
2125)
ST1
S1-26400/SX321-JEP

00, 02, 02

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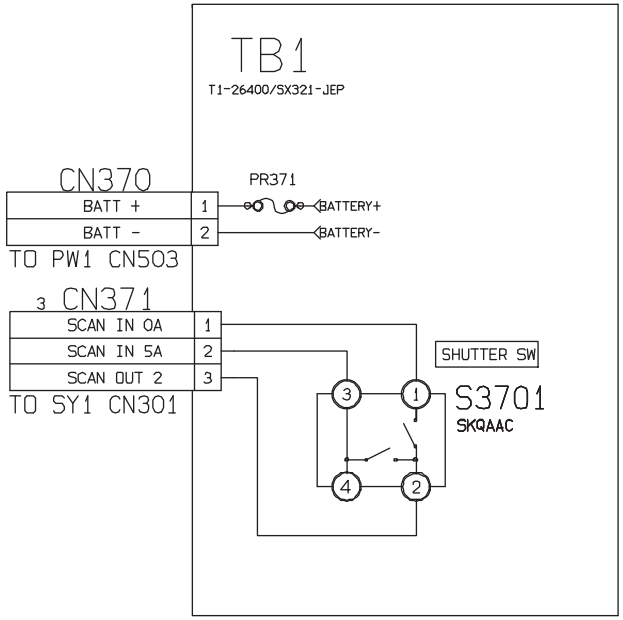

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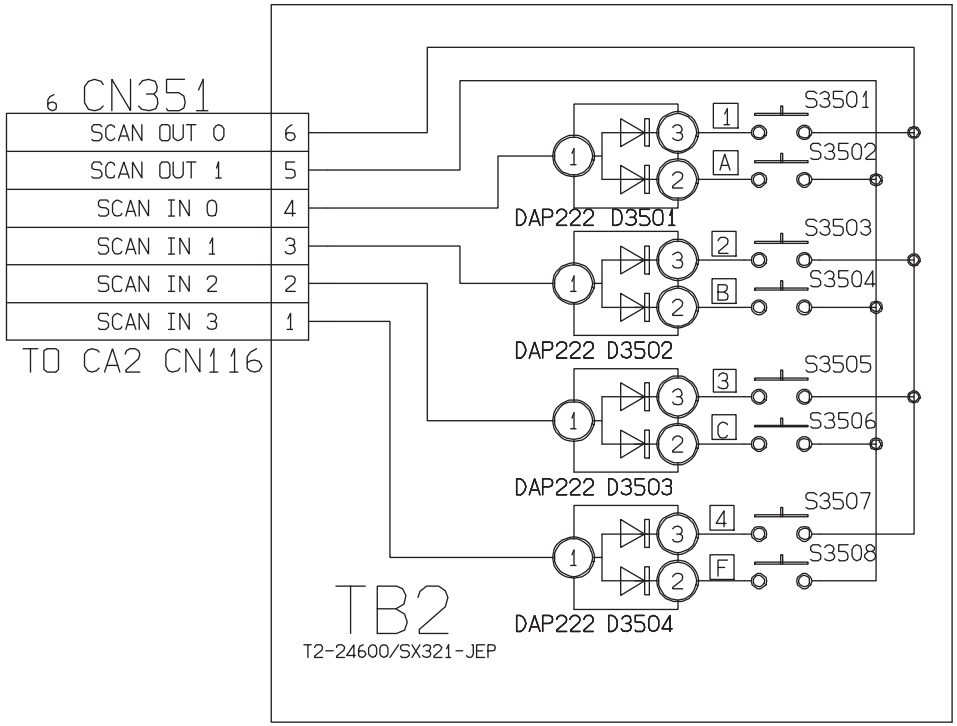

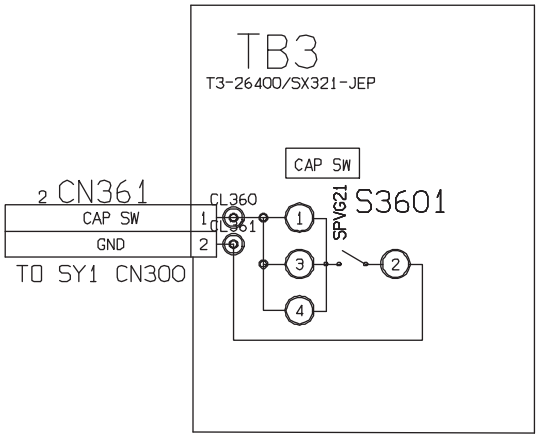
TB3
T3-26400/SX321-JEP
CAP SW
2 CN361
CAP SW
GND
1
2
CL360
CL361
SPVG21
S3601
1
2
3
4
TO SY1 CN300

7.4 Exploded Diagram

This section shows the following exploded diagrams.

- Exploded Diagram 1
- Exploded Diagram 2

CABINET 1

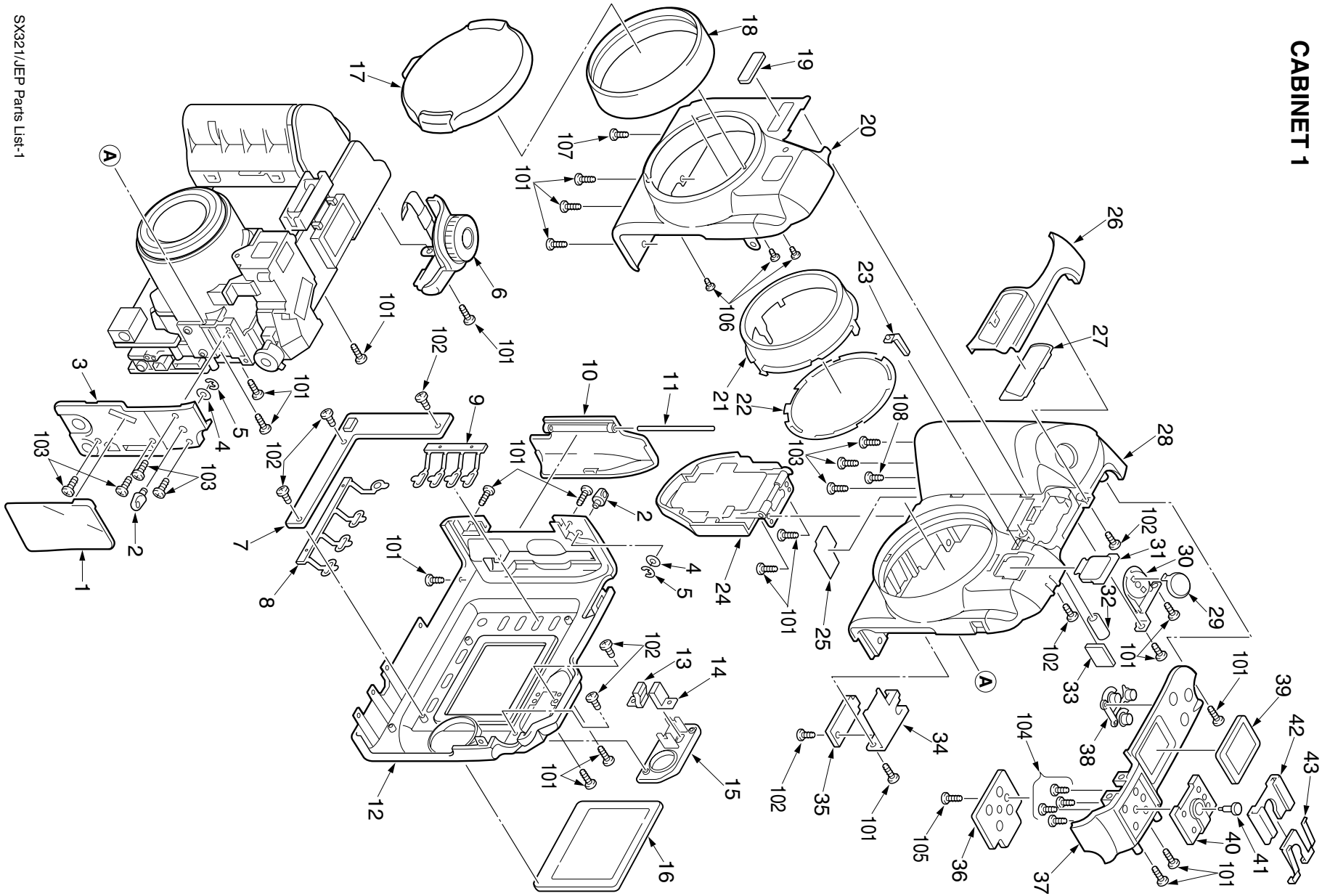

Figure 7-1. Exploded Diagram 1

CABINET 2

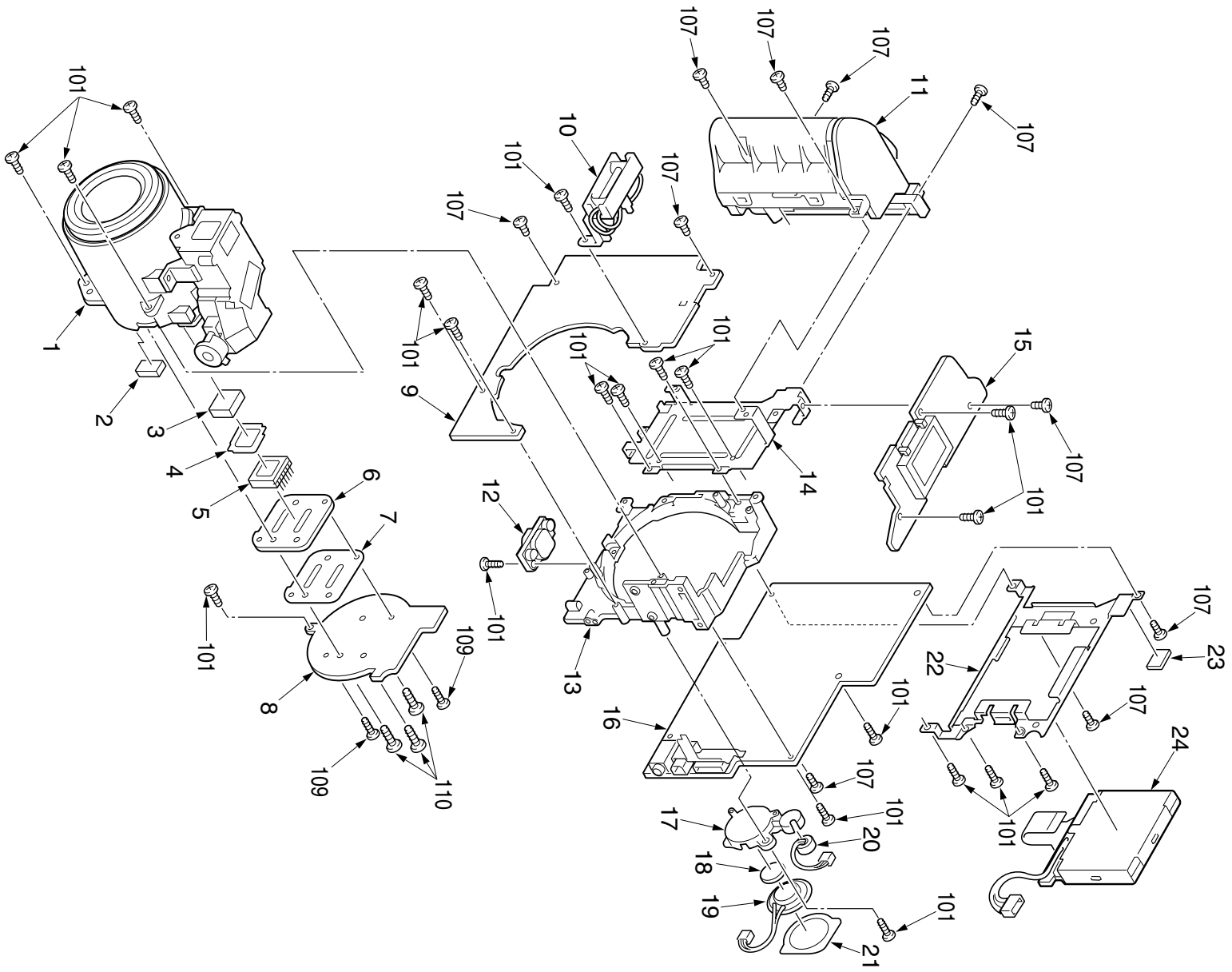

Figure 7-2. Exploded Diagram 2

7.5 Siemens Star Chart

The next page is the siemens star chart used for adjustment.